



AND OTHER NEW YORKERS

*Rabies, Medicine,
and Society
in an American Metropolis,
1840–1920*

JESSICA WANG



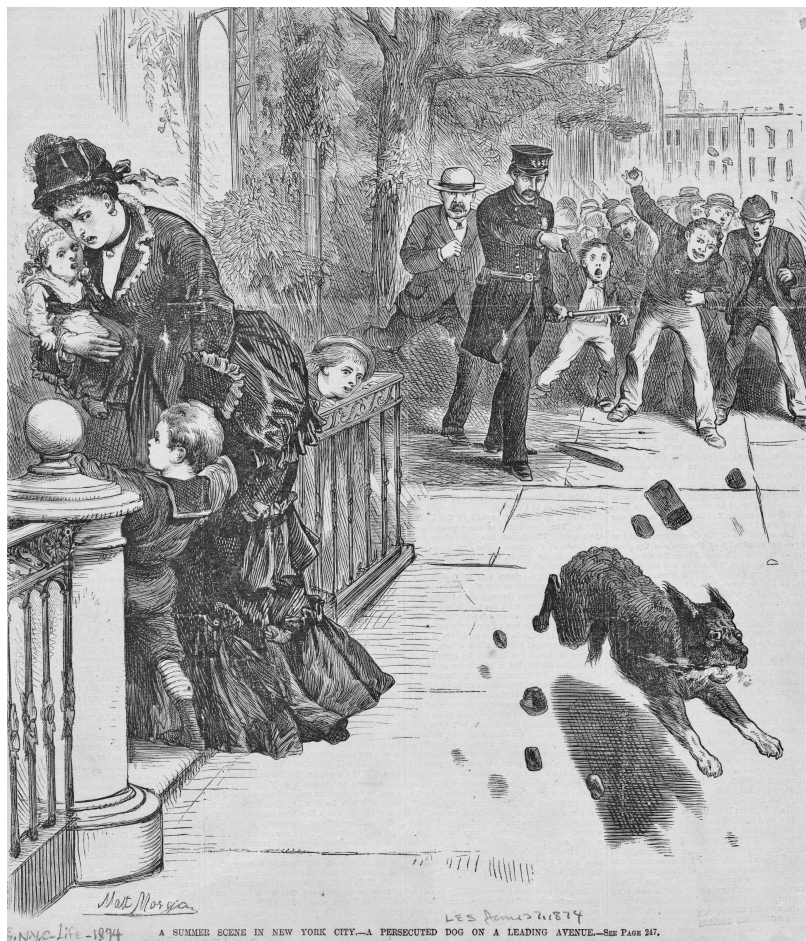
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Mad Dogs and Other New Yorkers

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Animals, History, Culture
Harriet Ritvo, SERIES EDITOR



Walt No. 10
N.Y. Life - 1874

A SUMMER SCENE IN NEW YORK CITY.—A PERSECUTED DOG ON A LEADING AVENUE.—See Page 247.

**MAD DOGS AND OTHER
NEW YORKERS**

RABIES, MEDICINE, AND SOCIETY
IN AN AMERICAN METROPOLIS
1840–1920

Jessica Wang



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In memory of Marilyn B. Young
Friend, scholar, activist, and consummate New Yorker

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A decade ago, I knew very little about the history of medicine and even less about animal studies and New York history, so my intellectual debts have piled up steadily over the years. First of all, my colleagues in the Department of History at the University of British Columbia supported this endeavor from the beginning. Leslie Paris tutored me in the history of New York City, and Bob Brain, who heroically read multiple chapters of the manuscript, directed my education in the finer points of the history of medicine. Tina Loo introduced me to the field of animal studies and to the lively intellectual community of the American Society for Environmental History, and she supplied the book's title. Leslie, Tina, Jeff Byrne, Anne Gorsuch, Carla Nappi, and Coll Thrush also provided valuable advice about specific chapters. Michel Ducharme decoded some of the more mysterious renderings of nineteenth-century French, among other valuable interventions, and Alejandra Bronfman, Joy Dixon, Bill French, Eagle Glassheim, Laura Ishiguro, Tamara Myers, Heidi Tworek, and the late Danny Vickers all provided conversation, hints, and pointers at multiple junctures. Alejandra and Carla, alas, have departed for greener pastures at other universities, while Danny's untimely death continues to leave an aching void. Nevertheless, we persevere.

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ren Center for Studies in American History during the first half of 2012. For the intellectual richness and sheer fun of the experience, credit goes to seminar co-conveners Andy Jewett and Julie Reuben, the enlightened administrative energies of Arthur Patton-Hock and Larissa Kennedy, and my fellow fellows in the 2011–12 cohort, especially Kornel Chang, Adam Nelson, and Mark Solovey. Life at the Warren Center left me fully convinced of the virtues of going away from home, and I followed up with brief visits in 2013 and 2015 as a visiting scholar at MIT’s Program in Science, Technology, and Society. At MIT, Dave Kaiser, Harriet Ritvo, Roe “the Master” Smith, Clapperton Mavhunga, Roz Williams, Deborah Fitzgerald, Chris Capozzola, and Dave Mindell offered a warm welcome, as did MIT-STS staff members Judy Spitzer, Patee Pinckney, Randyn Miller, and Karen Gardner, and old MIT-centered friends Wade Roush and Graham Ramsay. I should also thank Dave Mindell for the loan of a computer screen as a supplement to middle-aged eyesight, which is only appropriate since he did, after all, write a book about the *Monitor*. The luxury of a second Warren Center fellowship in 2018–19 provided a congenial environment for putting the finishing touches on the book as I embarked on new research, and I am once again grateful for having had the chance to enjoy the company of a new cohort of fellows, not to mention Harvard University’s tremendous library resources and never-ending opportunities for intellectual enrichment.

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I have Karen “Gigi” Girondel to thank for my ability to read French, which is also testimony to the power of good public schools. Unless otherwise specified, all translations from French are mine, as is responsibility for any errors. I also had occasion to read and cite one article in Russian (kudos to readers

who locate that note). That historical intervention would not have been possible without Marilyn Gray, Nelia Dubrovnik, Mischa Angelovskiy, Olga Yokoyama, Susan Kresin, Maria Rubins, and Elena Alexandrovna Krasnoshchokova, who generously let me sit in on their classes during three and a half years of post-tenure Russian language study, and also the training provided by my husband, Alexei, and my mother-in-law, Natalia Nikolaevna Melnikova.

Harriet Ritvo and Bob Brugger were early champions of this book, and I deeply appreciate their efforts in paving the way for its publication. It has been a pleasure to get to know Harriet, to tap into her vast insights into the history of animals, and to trade stories of our personal experiences with the human-feline nexus. Bob's attentiveness to well-crafted prose and his crusade against "the jejune very" remain seared into my consciousness, especially in this dark era of sophomoric presidential tweets. Bob's retirement left big shoes to fill at Johns Hopkins University Press, but Matt McAdam has forged ahead in his own inimitable fashion, and I am thankful to Matt for his skill in managing the publishing process and his sage advice en route. In addition, Will Krause, Hilary Jacqmin, Julie McCarthy, and the rest of the staff at JHUP stayed on top of an array of logistical issues with incredible efficiency, and Nicole Wayland looked after the copyediting with care and discernment. Credit goes to all of them for the ease with which this project went into production. Two anonymous reviewers also provided incisive critiques that resulted in a much shorter book and, more importantly, a volume of much greater analytical discipline. To those who will still have complaints in the end, I can only say that it could have been worse.

Unlike most historians who write about New York City, I confess that I had no particular love of the place at the outset of this project—it simply provided the best historical venue for studying the social history of rabies in urban America during the nineteenth and early twentieth centuries. In the course of my research, however, I came to appreciate the city's vibrant intellectual life and cultural energy. It also helps to have friends there. Affection and gratitude go to Sam Shah, Jose and Paula Moya, Dirk Brazill, Matt Morgan, Ellen Schrecker, the late Marvin Gettleman, Gloria Li, Cliff Ling, and the late Marilyn Young for opportunities to break bread, chat, and reminisce. Dirk and Marilyn also provided a roof over my head at times when I needed one, along with ever-ready conversation and companionship.

My father, James Chuo Wang, now retired from a distinguished career in molecular biology and biochemistry, readily took to enthused discussions of rhabdoviruses, viewed the oddities of nineteenth-century medicine with

amused interest, and provided invaluable assistance in navigating various newspaper databases. He and I also delighted in speculating about the health status of the many wandering dogs whom we observed on a father-daughter trip to Taiwan in 2011 (“是不是一隻瘋狗?”), and I am glad to report that, honestly, they looked perfectly fine. Lao Ba and my mother, Sophia Shu-lan Wang, also stayed on the lookout for interesting news stories about dogs, disease, and canine-human interactions, and they have remained ever-ready supporters of my academic endeavors, not to mention other aspirations.

My husband, Alexei, professes to hate all things medical, but nonetheless he was always a ready resource for questions about the history of science, and when we were living in Georgia, he made our house into a home by letting in the neighbors' cat, who subsequently became our own. Mrrr delivered a litter of kittens shortly thereafter, which led to our current status as a two-cat household. Mrrr and Buttercup appear to have viewed this book mainly as an impediment to lap time, prompt feeding, and other forms of attention (i.e., service), and *Felis silvestris catus* appears only fleetingly in these pages. Nonetheless, two Beastly Cats and their deft ability to forge interspecies relationships through charm, affection, and sheer willpower were its inspiration.

Finally, this book is dedicated to Marilyn Young, the extraordinary historian of US foreign relations and critic of American militarism, who passed away in February 2017. I first met Marilyn at a conference in 2002, and we eventually saw enough of each other to become friends. Marilyn possessed an ever-lively intellect and generous spirit, and she was an endless source of positive reinforcement for countless younger scholars. When I started working on this book, I was a little afraid Marilyn would berate me for not tackling a more serious topic, but she peppered me with questions and had nothing but warm and encouraging words for my sojourn into the history of animals and disease. It was always fun and enlightening to visit Marilyn and talk for hours about recent scholarship, fulminate over the latest outrages of US foreign policy and global events, discuss the difficult and troublesome dynamics of narrative, memory, and history, and also compare notes on novels and films that we had read or seen. Shortly before Marilyn passed away, I had the chance to enjoy an exchange of emails and tell her about my new research on tropical agriculture and American empire in the early twentieth century, a project that will be poorer for her absence. Marilyn, you were one of a kind, and your friends miss you dearly.

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ABBREVIATIONS

API	American Pasteur Institute
ASPCA	American Society for the Prevention of Cruelty to Animals
BDE	<i>Brooklyn Daily Eagle</i>
MR	<i>Medical Record</i> (New York)
NYCDH	New York City Department of Health
NYH	<i>New York Herald</i>
NYJM	<i>New York Journal of Medicine</i>
NYMJ	<i>New York Medical Journal</i>
NYPI	New York Pasteur Institute
NYS	<i>New York Sun</i>
NYT	<i>New York Times</i>
NYTr	<i>New York Tribune</i>
OAF	<i>Our Animal Friends</i>

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Mad Dogs and Other New Yorkers

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Introduction

In June 1841, the *New York Tribune* called upon the local government to contain the menacing hordes of loose dogs in public places. The paper's editor indignantly pleaded, "Why don't our Corporation take care of the Dogs now infesting our streets in great numbers? We have law enough, and a Proclamation from the Mayor superadded, but the Dogs appear to have a sovereign contempt for such nonsense. Hot weather is now upon us; every now and then a child falls a victim to Hydrophobia and the danger increases." He concluded with a final, ringing salvo: "Where is the Register? Fathers of the City! take care of its children, and muzzle the dogs!"¹

The *Tribune's* urgent appeal constituted just one of the era's countless complaints about the seemingly endless stream of roaming dogs who impeded safe passage across an already unruly cityscape and threatened to transmit a terrifying, implacable, and absolutely fatal disease. Throughout the decades of ever-spiraling growth that defined New York City from the 1840s to the 1910s, the bone-chilling cry of "mad dog!" possessed the power to upend completely the ordinary routines and rhythms of urban life, as frightened locals scrambled either to combat the danger or get out of the way. For physicians, the ability of rabies to ravage both body and mind fascinated and confounded the city's medical elite at a time when professionalization, changing ideas about disease, and the advancement of public health moved in lock-step with rapid urbanization. This book explores the history of rabies within the shifting contexts of New York's urban and medical evolution in order to shed light on the social and cultural history of the disease itself, the place of animals within the city's unwieldy social order, the nature and implications of medical understandings of hydrophobia therapeutics and anatomical explanations for the disease, and the institutional and political expectations

that shaped Pasteurian rabies vaccination and canine animal control in the late nineteenth and early twentieth centuries.

Neil Pemberton and Michael Worboys have commented on the relative lack of historical attention to rabies, despite the condition's cultural notoriety. Although rare in incidence, the disease has loomed large in the human imagination in multiple settings across time and around the world.² Scholars have begun to take rabies more seriously in recent years, and a handful of studies have provided considerable insight about the medical and societal dimensions of this animal-borne affliction in the nineteenth and twentieth centuries in Great Britain, France, and other parts of Europe, southern Africa in the colonial and postcolonial periods, French colonial Madagascar, the United States, and Japan, along with the malady's visibility in medical texts dating back to antiquity.³

My study of New York City revisits some familiar themes from this literature, particularly the place of dogs in everyday street life, the class politics, urban anxieties, and fears of civilizational decline that permeated discourses about dogs and zoonosis, the tropes of animality and demon possession that described the horrific, uncontrollable symptoms of rabies, physicians' debates over the nature and etiology of hydrophobia, and the contentious political struggles surrounding animal control laws and their expansion of state power. As historians of medicine have frequently pointed out, however, disease is a social phenomenon, and local contexts shape the meanings and medical ideas attached to a given illness, as well as the institutional systems designed to address it. Although responses to rabies in diverse urban centers around the world frequently resembled each other in broad outline, experiences in one locale versus another differed in respects both subtle and pronounced. The racial divides along the black-white binary that infused every corner of social life in British colonial South Africa, for example, inevitably entered into notions of proper dog ownership and the regulatory practices of canine animal control, whereas more general class-based, civilizational anxieties of the urban bourgeoisie characterized responses in London, Paris, and New York.⁴

At a more fundamental level, time and place also raise ontological questions about whether it is even possible to think of conditions in different eras and cultures as "the same" disease. At the very least, historians have learned to be cautious about equating current definitions of specific medical conditions with ailments in the past. In a classic study from the 1930s, for example, Ludwig Fleck detailed the analytical divides between twentieth-century un-

derstandings of syphilis and the early modern category of “carnal scourge.” Decades later, Andrew Cunningham suggested that the laboratory and its centrality to the bacteriological revolution so transformed the mental apparatus surrounding infectious disease as to undermine any simple, one-to-one correspondence between historical and present-day classifications.⁵ Changes at the molecular level or the varying ecological and social contexts of disease compound further the difficulties of historical comparison, since infectious agents themselves may change biologically over time, and local ecologies strongly condition their spread.⁶

Such realities underscore the nature of diseases as simultaneously the product of biological agents or circumstances independent of human will or consciousness and yet profoundly social in their multiple guises: for example, as objects of human contemplation, sources of individual lived experiences with debilitation and illness, promoters of broad-based fears and social disruptions, and targets for all manner of institutionalized interventions.⁷ For rabies, these considerations require mindfulness of the shifts and continuities that defined the disease as it moved through human history. Rabies in the past was *not*, in a historically contingent, socially embedded sense, the product of a particular, bullet-shaped rhabdovirus with an RNA-based genome covered by a glycoprotein membrane, which could be detected in the victim’s saliva or other bodily fluids and tissues through polymerase chain reaction and a direct fluorescent antibody test. When early nineteenth-century observers spoke of a “virus” of rabies, they had in mind a poison or toxin, and not a biologically active, self-replicating agent. By the 1880s and 1890s, germ theory and the rise of bacteriology allowed physicians, medical researchers, and public health professionals to imagine a living “microbe” or “germ” of rabies that they hoped eventually to describe more fully, but that defied visualization by the means they had on hand. Toward the end of the century, the idea of the filterable virus, a submicroscopic entity so small that it passed through the fine Chamberland-Pasteur filter designed to trap bacteria, added a new sense of biological specificity to the rabies virus, but its precise characterization remained elusive.⁸ No one actually “saw” rhabdovirus until the 1960s, after the advent of electron microscopy.

Nomenclature also signals important differences between historical and present-day formulations. In the nineteenth century, rabies, or in the case of dogs, *rabies canina*, referred to the dangerous, transmissible form of madness in animals whose bites led humans to develop hydrophobia, the human variant of the disease. Some physicians even considered hydrophobia and rabies

to be separate conditions.⁹ The distinction was hardly cut-and-dried, however. Stories in New York newspapers not infrequently described animals, particularly horses, cattle, and other ungulates, but occasionally dogs as well, as suffering from hydrophobia.¹⁰ In such instances, hydrophobia tended to indicate the suffering victim, regardless of species, as opposed to the mad, violent, salivating animal perpetrator of disease. At times, medical practitioners, such as physician and New York City public health official Charles P. Russel in a lengthy report on hydrophobia published in 1874, also used the terms somewhat interchangeably.¹¹ In the 1880s, as a germ-based understanding of the condition took hold, some medical experts began to call upon the profession to abandon the term “hydrophobia” in favor of “rabies,” but the latter appellation did not fully supplant the former as the preferred label until the 1920s.¹² Physicians on both sides of the Atlantic also distinguished between true hydrophobia and false cases, in which patients exposed to nonmalign animal bites managed to scare themselves to the point of severe illness and even death. In the middle decades of the nineteenth century, medical essays and treatises tended to downplay the significance of false cases and view them mainly as a curiosity. In the 1880s and 1890s, however, the rise of neurology as a medical specialty, combined with burgeoning cultural anxieties about the dangers of urban civilization to human health, whether mental or physical, led to growing interest among physicians in the relationship between imagination and disease. Designations such as lyssophobia, lyssaphobia, pseudo-hydrophobia, simulated hydrophobia, spurious hydrophobia, and false hydrophobia came into common usage, and by the 1890s, medical textbooks enshrined pseudo-hydrophobia and its terminological variants into the pantheon of recognized nervous conditions.¹³

These complexities of nineteenth-century American medical understanding point to the unique, socially rooted circumstances that fixed conceptions of rabies in particular locations and moments. Yet, despite the need to remain ever-cognizant of historical specificity, the cultural association of rabies with dogs, extreme symptoms, and fatality has also been comparatively stable across space and over long stretches of time. In the obligatory natural history reviews that typically opened nineteenth-century hydrophobia treatises or learned discourses in journal articles and medical society presentations, authors commonly remarked on sources from Greek and Roman antiquity, and also early commentaries in Hindu, that identified a disease associated predominantly with dogs and other canines, described the fearsome behavioral transformation of infected animals, and recognized the potential deadliness

of their bites in terms perfectly recognizable to readers in the 1870s and 1880s, and today as well.¹⁴ By the middle decades of the nineteenth century, a rough medical consensus agreed on the symptomatology of canine madness in dogs and hydrophobia in humans, including the subtle changes in mood that presaged the full onset of madness and viciousness in dogs afflicted with “furious rabies,” the strangely transformed voice of the rabid dog or its silence in the disease’s less common variant of “dumb rabies,” and the specific nature of the paroxysms in humans that the experienced medical eye could easily distinguish, according to authorities, from cases of tetanus, epilepsy, or other illnesses frequently confused with hydrophobia. Some novel developments between the 1850s and 1880s, such as attention to abnormal temperature or urine in symptomatic cases that marked the new presence of thermometry and chemistry in American medical practice, offered additional information without significantly altering basic assumptions about the disease. The era’s zeal for medical statistics also furnished new insights about incubation periods and transmission rates. Where ancient Greek sources generated the commonplace perception of the “dog days of summer” as the most dangerous time of the year, mid-nineteenth-century statistics, such as those in an 1856 report on hydrophobia by the American Medical Association or an analysis that same year by New York physician J. Lewis Smith, demonstrated the year-round prevalence of rabies. Such findings indicate the simultaneous historical continuity of rabies as a dog-based source of terror alongside the refinements and changes in the conceptual apparatus surrounding the disease.¹⁵

Indeed, rabies intrigues precisely because it possesses a long historical lineage of constancy across the divides of space, time, and culture, yet it also remains rooted in the specificities of local contexts. Hence, it is easy to slip into a universalist perspective that views twenty-first-century rabies and nineteenth-century hydrophobia as the same disease, while simultaneously reminding oneself to avoid allowing present-day biases to stifle and mislead the historical imagination. To manage this dual sensibility, I generally employ the historical distinction between hydrophobia and rabies when describing the close specifics of nineteenth-century events, but in addition to using the terms interchangeably for developments in the early twentieth century, I sometimes refer to rabies in the present-day sense when speaking from a more distanced narrator’s perspective. I do so partly as a stylistic measure, in order to avoid tedious repetition, but also, and more importantly, as a trans-historical gesture to acknowledge that even as hydrophobia in New York City

bore the identifying markers of its nineteenth- and early twentieth-century past, the disease is also recognizable to us today in its contemporary guise.

This choice in terminology also reflects a larger concern that has long informed histories of medicine, namely, the social dimensions of disease.¹⁶ In this study, rabies functions as both lens and subject matter, as part of a dialectic between disease and society. The specific settings of New York urban medicine and US political culture shaped therapeutics and postmortem diagnosis, the institutionalization of Pasteurian rabies vaccination, and the forms of public-private collaboration that defined American governance and its approaches to animal control. The history of hydrophobia also offers opportunities to reflect on domestic animals' role in fomenting the disruptive choreography of nineteenth-century street life, the realm of belief and affect that surrounded human-animal relations, and the cultural perceptions and practices associated with death and dying in the United States.

At one level, this book is a history of medicine that explores the social world of New York physicians, their ideas about hydrophobia as a disease state, and the vibrant array of axiomatic ideas and therapeutics that they brought to bear in their efforts to treat dying patients and to comprehend the nature of a rare and perplexing disorder. My analysis looks into the problems of democratic society and the global flows of plant derivatives that structured therapeutic options in the American materia medica of the nineteenth century, as well as the powerful tradition of anatomical science that shaped leading physicians' understanding and expectations about the physiological dimensions of rabies and the disease's postmortem manifestations. In addition, the institutional systems that evolved around Pasteurian rabies vaccination from the mid-1880s to the early 1910s testify to how the specific circumstances of philanthropy, industry, and public health in New York City profoundly conditioned the production of live vaccines and their distribution in both the city and the nation.

As this last point indicates, this volume is also a work of urban, political, and cultural history that looks at the unwieldy combination of people, dogs, and deadly disease, and how it shaped everyday life, politics, and society in New York City from the 1840s to the 1910s. As the city at the leading edge of American urbanization, New York showcased both the dizzying possibilities and gaping pitfalls of life in a metropolis. Whenever the challenges of sanitation, public health, and other urban problems loomed in the United States, New York generally experienced them first, and the city's particular mix of institutions, organizations, and communities renders it an ideal setting for

historical consideration. From the early national period onward, physicians and other determined elites founded gentlemanly societies and other forums in order to make New York a stronghold of intellectual life that could boost the city's own prospects as well as serve the nation-building aspirations of the United States as a whole, by creating institutions to rival those of the leading European cultural centers. New York also quickly developed into the United States' financial capital and communications hub, which facilitated the rise of a dense news environment, including both medical journalism and a thicket of newspapers, whose manifold offerings continued to grow with each passing decade.¹⁷ Reportage ranged far and wide, and my version of New York therefore encompasses not just the geographical space defined by formal city limits, but the broader virtual world of events and ideas contained within the city's print media. Although not all of the events described in this book took place within New York's borders, the local news culture incorporated national and global developments into the city's history.

In addition to its status as a center of medicine and journalism, New York also became a pioneer in public health. Physician and former city inspector John H. Griscom's 1845 survey of sanitary conditions in the neighborhoods of the working poor constituted an early American landmark in the evolution of public health and sanitary reform, a movement that Griscom himself helped to spearhead. The permanent institutionalization of public health bureaucracies as a part of the municipal government eventually followed, with the establishment of the Metropolitan Board of Health in 1866 and then the New York City Board of Health in 1870. Institutional stability, sanitarian activism, the growing medical authority of germ theory, and the rise of ambitious public health professionals provided the basis for wide-ranging and expansive initiatives, and in the 1890s, the energetic work of the Department of Health's pioneering Research Laboratory earned the city a national and international reputation.¹⁸

A thriving health department offered just one option for public health provision amid multiple nineteenth-century institutional alternatives. In New York City's abundant organizational culture, private entities—the short-lived American Pasteur Institute erected in 1886, followed by French physician Paul Gibier's highly successful New York Pasteur Institute, founded in 1890—introduced Pasteurian rabies vaccination to the United States. Meanwhile, New York also became a driving force behind animal welfare advocacy in the United States, with the founding of the American Society for the Prevention of Cruelty to Animals (ASPCA) in 1866 and the novel association's

formal role in enforcing newly established laws against cruel treatment of animals. In the mid-1890s, the ASPCA also acquired the power to oversee canine animal control, a responsibility that in the early twentieth century placed it in direct conflict with the Department of Health over the basic structure of governmental authority and the question of whether mitigation of animals' suffering or rabies prevention should form the primary rationale for management of the urban dog population.

Institutional history thus undergirds one of the major analytical concerns of this study, namely, the mixed public-private relationship as a key feature of governance in the United States. The organizational structures behind the introduction of Pasteurian rabies vaccination to New York and the city's systems of animal control reveal the centrality of porous boundaries between public and private to the exercise of public policy in the United States. The history of rabies in New York illuminates other matters as well. It highlights the challenging nature of everyday life in a city populated by domesticated animals, in which cats and dogs roved about freely whether they were owned or stray, and in which countless other animals, in their functions as sources of labor, food, and other resources, contributed to the unsettling and frequently chaotic conditions of urban street life throughout the decades that marked New York's most tumultuous era of urban growth. The juxtaposition of dogs, disease, and medicine also touches on myriad aspects of American culture from the mid-nineteenth to the early twentieth century, ranging from the discourses and rituals that surrounded death and dying, to the tests of credulity that rabies therapeutics offered to a democratic society's fixation with distinguishing truth from bunk, to the obsession with civilization, modernity, and American nervousness that marked attitudes toward dogs and medical ideas about rabies at the turn of the century.

My account proceeds thematically in order to capture, at least in part, the multifaceted nature of a disease that intersected in myriad ways with medicine, society, politics, and culture. Even as each individual chapter covers a broad time period, however, the book's center of gravity gradually moves forward from the mid-nineteenth to the early twentieth century. Chapter 1 starts with New York City itself, its rapid growth and ever-changing expanses, and the consequences of shared space between humans and domesticated animals, especially dogs and the panics they sparked on city streets. In an era of jarring urban transformations, dogs and their disruptive peregrinations on public thoroughfares remained a troublesome constant, even as the turn-of-the-century tropes of overcivilization and degeneration sparked novel ways

of expressing and wrestling with old, well-established anxieties about dogs and disease. Chapter 2 then addresses the cultural history of rabies as expressed in popular discourses about death and dying. Amid the frequently sensational narrative conventions of New York's penny press, representations of both human and animal suffering and dying testify to the meanings that people derived about human-animal relationships, the management of death, and the art of dying from their encounters with hydrophobia and rabies throughout the nineteenth century.

From the social and cultural priorities of the first two chapters, the middle portion of the book delves more deeply into the history of medicine, with close discussions of rabies remedies and the professional, national, and global contexts of nineteenth-century American therapeutics, and the defining role of pathological anatomy in shaping New York physicians' ideas and expectations about rabies, its etiology, and its central characteristics. Chapter 3 decodes the workings of nineteenth-century remedies, the global networks that produced them, and their embeddedness in the problems and challenges of a democratic political culture. Chapter 4 then turns to anatomical commitments, constructed out of American medical practices in combination with the legacy of the Paris clinical school, that shaped elite physicians' assumptions that they would eventually find unique, visually identifiable lesions on bodily structures that could be used to diagnose hydrophobia postmortem. Pathological anatomy offered powerful means for discerning the nature and workings of disease as it moved through the human body, and it remained a commanding framework for thinking about rabies and its destructive effects on the nervous system despite decades of ambiguous autopsy results.

Finally, the last two chapters move to the domain of institutions and politics, and they enter more decisively into the time period after 1885, a year that signified a key turning point with the eminent French scientist Louis Pasteur's announcement that he had developed a procedure for post-bite vaccination against hydrophobia. Chapter 5 delves into the introduction of Pasteurian rabies vaccination to the United States and the three different institutional models that shaped preventive hydrophobia treatment as a form of public health provision in New York City from the 1880s to the 1910s. In particular, I demonstrate the centrality of the nascent pharmaceutical industry to Paul Gibier's institutional strategy before showing how the rise of public health conspired with regulation, technological change, and random misfortune to eclipse the New York Pasteur Institute. Chapter 6 then turns to the politics of canine animal control, with an examination of the ASPCA, the public-

private relationship, and the complex political and legal history surrounding management of New York City's dog population in the nineteenth and early twentieth centuries. The seemingly mundane policy arena of animal control ultimately offers major insights about the history of American political development, especially the importance of a blended public-private relationship to the basic workings of American governance.

To contemplate the history of a disease is to enter into the mind-set and imagination of the past, to make sense of ways of thinking that otherwise appear unfathomable, and also to find the strangeness in conceptual frameworks and folkways that one normally takes for granted. The nineteenth- and early twentieth-century history of rabies in New York City opens a window onto a robust and disorderly world of domesticated animals on city streets, a place that contrasts sharply with the relative placidity of urban public space in the United States today. The oddity of both the unfamiliar and the familiar resides in the endless array of proposed hydrophobia remedies that frequently sounded peculiar even by the standards of the time yet also reflected established ideas about health and the body, and in a set of medical commitments to the centrality of an anatomical tradition that, according to its own precepts, cast reasonable doubts on the validity of Pasteurian rabies vaccination. The material conditions of Pasteurian science highlight the frequently unacknowledged uses of animals' bodies as sites of pharmaceutical advancement, while the unsung history of urban dogcatching reveals a venue for policy innovation and state-building. These rich histories, at once so distant yet so reminiscent of our own era's circumstances and contradictions, begin on the streets of New York.

Dogs, Humans, and the Uses of Urban Space

In nineteenth-century US cities, most dogs, whether owned or stray, rambled about on their own with a freedom now difficult to imagine, even though city residents complained endlessly about the marauding canines who populated public spaces. Although historians have rarely paid much attention to dogs' movements, their wanderings—in the streets, parks, schoolyards, workshops, stores, music halls, saloons, apartment buildings, and other parts of the cityscape—were a fixture in New Yorkers' everyday experiences. Usually, dogs blended into the background of life's regular activities, but moments of panic and terror over animals that appeared ill and aggressive also punctuated the ordinary pace and rhythms of the city's routines.

This chapter explores the social history of mad dog scares at ground level, from the perspectives of New York City's social geography, the place of domesticated animals in urban life, and the interplay between people, dogs, and urban space, along with the larger cultural anxieties that played into perceptions of dogs and disease. In the “anthrozootic city” of the nineteenth and early twentieth centuries, in which domesticated animals served as highly visible sources of food, raw materials, transportation, and companionship, people and domesticated animals lived in close proximity and regularly crossed paths. Encounters between humans and animals highlighted the layout of the city itself, particularly the built environment of its public and private spaces. Humans' aspirations for control could never entirely contain animals' proclivities, and the endeavors of dogs, pigs, cattle, and other creatures on the loose not infrequently disrupted the normal course of quotidian pursuits, to both the irritation and amusement of New York's human inhabitants. A mad dog on the run, for example, could spread not just fear and hor-

ror, but also a sense of fun and excitement over a terrifyingly enjoyable public spectacle.

Every interaction between human and dog in New York City reflected, in microcosm, the fundamental categories of social analysis. When people chased down or ran from suspected mad dogs, or when they fell victim to dog bites, they enacted small dramas of class, gender, and social geography, all set against a backdrop of rapid urban growth across the decades. The history of mad dog scares and dogs' movements throughout the city is also a history of the city itself—its unwieldy and shifting expanses, buoyant social life, folkways, and dystopian imagination.

The Lay of the Land: New York City across the Decades

Dogs' historical misadventures underscored the continuities of urban life in an era defined at the same time by jarring social, economic, and political upheaval. Between 1840 and 1920, New York grew from an already large city of more than 300,000 people to a metropolis of 5.6 million, and radical transformations accompanied this explosion in population. Amid a dramatic economic shift from an age of proprietary capitalism to one of large corporations and the dizzying possibilities of high finance, New York spread its borders, laid down new infrastructure, and strived for world-class status while city residents fought over rights and opportunities in a society highly stratified by class and national origin. Yet, even in the midst of the momentous changes that divided antebellum New York from the metropolis of the 1870s and beyond, growth frequently meant differences in degree, but not in kind. Throughout the period from the mid-nineteenth to the early twentieth century, New York held sway as America's largest city, and it functioned as a hub within regional, national, and global economies. Worries about the threat of urbanization to individual morality along with questions about the city's fundamental governability, whether from the standpoint of basic sanitation needs or the dangers of political corruption, also remained constants. By 1890, New York looked and felt profoundly different from what it had been half a century earlier, but it also seemed, in important respects, more or less unchanged.

The New York of the 1840s, with its low-slung buildings of no more than four or five stories, its nascent transportation infrastructure, its farms north of 14th Street, and its northern border of 59th Street, might appear far removed from its twenty-first-century descendant. The small scale of old New York, however, should not obscure recognition of the antebellum city's remarkably complex social geography, infrastructure, and economic organiza-

tion. The chaotic and transformative processes of Gilded Age economic development rested on a foundation built decades earlier. In 1840, Americans already considered New York a “Great Metropolis.” As the nation’s economic powerhouse, the city provided the primary gateway for goods to travel to and from Europe. By the 1850s, New York would establish itself as America’s premier hub for the movement of capital and vie for global financial status second only to London. Fashionable New Yorkers built elegant homes in Washington Square and promenaded on Broadway, with its alluring array of shops for the upper crust. The city’s first millionaires emerged in the 1840s, and decades before the excesses of the Gilded Age, they already enjoyed an opulent lifestyle that included elite clubs, summers in Saratoga, and elegant balls where the wealthy could mingle and display their finery.¹

Physically, the city crowded around what Americans now know as Lower Manhattan, but early on, transportation systems established New York’s interdependence with the surrounding region. Frequent ferry service across the East River tied New York to Brooklyn, and across the Hudson River to Jersey City and Hoboken. Tens of thousands of commuters already streamed in and out of the city on a daily basis by the mid-nineteenth century. By 1860, four out of ten Brooklyn wage earners worked in Manhattan, and the expansion of road systems and railroad service also granted relatively convenient access to New York from a wide swath of New Jersey that encompassed Elizabeth, Orange, Newark, and Paterson, a commuting pattern that continues over 150 years later. This combination of proximity and accessibility to New York City helped fuel the rapid economic expansion of industrial centers in New Jersey and Brooklyn.² Meanwhile, within New York City’s formal boundaries, railroad lines and urban growth moved in tandem across the middle decades of the nineteenth century. The Third Avenue Railroad, which ran from Broadway and Park Row (a few blocks south of City Hall) up to 61st Street in 1853 and soon stretched another twenty-five blocks to 86th Street, provides just one illustration of how railways marked the city’s widening reach.³

Beyond transportation infrastructure, other technological and social developments underscored New York City’s spatial evolution and transformation into a regional, national, and global force. News already circulated in the United States with impressive speed in the early nineteenth century, thanks to postal policies that supported free exchange of issues between publishers. With the rise of telegraphy in the 1840s, New York’s role as the hub of a developing telegraphic and information network reinforced the city’s economic

prowess and national image.⁴ Residential patterns that first began to separate property owners and renters in the early national period continued to shift in the 1830s and 1840s, as geographical expansion and economic stratification produced residential neighborhoods with distinct, class-based identities. A self-conscious architectural grandeur began to displace modest structures of wood and brick, as monied elites sought to showcase their stature and remake the city to mirror their self-image. Nowhere was that transformation more visible than in Lower Manhattan, where, following a devastating fire in 1835, financiers rebuilt Wall Street as a physical embodiment of wealth, status, and the authority of capital.⁵

Elsewhere, the restless efforts of the rich to escape from population growth, industrial development, and concomitant shifts in the character of neighborhoods also contributed to the city's changing built environment. In the early decades of the nineteenth century, shipping, trade, and manufacturing came to dominate the waterfront, once a blended area of commercial and residential spaces. Already in the 1820s, the wealthy sought new territory, and they soon established Washington Square and Union Square as fashionable bastions of high society following their flight from the city south of Houston Street, their former stronghold. In the antebellum decades, the old Knickerbocker elite and strivers with new money also began to colonize the lower reaches of Fifth Avenue, as part of their relentless march northward, in search of real estate opportunities and physical isolation from a rapidly growing immigrant, working-class population. Thus long before the post-Civil War period, when Fifth Avenue on the Upper East Side, between 40th and 86th Streets, became the city's preeminent neighborhood, members of New York's upper crust had already developed a restless taste for novelty and exclusivity in their drive to mark urban space as their own.⁶

This geographical expansionism reflected not just the aspirations of the privileged establishment, but larger conflicts over class, immigration, economic change, and governance. In the mid-nineteenth century, Irish immigration transformed the city as profoundly as the influx of southern and eastern European immigrants would during the decades surrounding the turn of the century. More than three million immigrants landed in New York between 1840 and 1855. By the 1850s, more than half of the city's population, and more than three-quarters of its workforce, was born abroad. Thirty percent of New York's residents came from Ireland alone, and they formed the core of New York's manual labor force, as well as an urban working class that emerged with mid-nineteenth-century industrialization.⁷

Immigration dramatically reshaped perceptions of politics, space, and economic relations. With the displacement of artisanal republicanism by the new working class, the structure of political life shifted from a deferential reliance on the city's wealthy elite to the mass-based politics of the urban political machine. This "political reordering of New York," to use Amy Bridges's apt phrase, manifested itself spatially as well.⁸ As the mixed neighborhoods of the old walking city gradually metamorphosed into the class-stratified urban geography of the 1850s, the Lower East Side became distinctly working class, and particular wards, while mixed, acquired different ethnic orientations, such as the Irish-dominated Fourth and Sixth Wards or the Germans congregated on the east side surrounding the Tenth and Eleventh Wards. At Five Points, home to the poorest of the poor, the neighborhood's mixture of races and ethnicities also contributed to decades' worth of sensationalized portraits of urban vice and crime in the city's dark underbelly. When reformers—most famously Charles Dickens—wanted to write about urban poverty at its worst during the antebellum period, they flocked to Five Points to describe the jarring noise and vile smells of the streets, the dank and pestilent corridors of substandard housing, and the dissolute and criminal characters of the neighborhood's inhabitants, in what eventually became a clichéd refrain of subterranean misery and degradation.⁹

Ethnic and class differences created intense cultural and political strife. In the Bowery and other working-class neighborhoods, a boisterous and rowdy public culture enlivened the streets. As Christine Stansell has observed, the Bowery constituted "the plebian counterpart of elegant Broadway to the west"—it provided a place for working-class New Yorkers, particularly young people, to gather, shop, seek amusement, and go out on the town dressed to the nines.¹⁰ Working-class patterns of leisure and culture, however, profoundly challenged middle- and upper-class pretensions. Male brawling in the streets between competing gangs or political factions, or scenes of the ubiquitous Bowery Boy out on the town with his "Lize" by his side, deliberately defied bourgeois notions of gentility and refinement. Notorious clashes between the nativist Bowery Boys and the Irish Dead Rabbits in the 1850s and early 1860s signified the political importance of street fighting and the ethnic divisions that governed New York politics. The predominance of skilled tradesmen among the city's large contingent of German immigrants placed them higher on the social scale than the poverty-ridden Irish, but their patterns of sociability organized around drink, as well as the large portion of Catholics and Jews among their numbers, also aroused the prejudices of

native-born Americans aspiring to Victorian respectability in the antebellum years.¹¹

Over the next half century, this mid-nineteenth-century New York world reconfigured itself in visible and significant ways. Geographically, the metropolis steadily expanded until the final delineation of its present-day boundaries. By the 1890s, some of the city's wards were among the most densely settled spaces on the planet, and by 1913, New York had the largest human population of any city in the world. The skyline moved upward with an impressive array of skyscrapers of twenty, thirty, and even fifty stories built between the 1890s and 1910s, and the city's new verticality symbolized a modern identity built on advanced technology, high finance, intellectual creativity, and ambition. Steam power and electricity quickened the pace of transportation, communications, and industry, which changed the rhythms and lifestyles that defined where people lived and worked, transformed the flow of information in the world of business and capital, and unleashed the productive potential of the factory system. The Tammany Hall political machine, still nascent and vying to solidify its power in the antebellum period, came into its own in the 1870s and dominated New York politics until the 1930s. A more elaborate, more highly bureaucratized governmental structure, exemplified by the establishment of a formal police force in the 1840s, the rise of a public health bureaucracy in the 1860s, the reorganization of street cleaning in the 1890s, and other institutional developments, also reshaped city government over the decades.¹²

Alongside these changes in technology, infrastructure, politics, and institutions, economic fortunes turned and social divides expanded. Old money paled compared to the vast fortunes that defined Gilded Age wealth. The shift in the labor market from artisanal production to an industrial working class, already well on its way by the mid-nineteenth century, proceeded further apace as corporate and industrial capitalism remade the urban economy in the post-Civil War years. A new wave of southern and eastern European transplants joined the continued influx of peoples from older, more established sources of immigrants, as part of the nearly eighteen million people who entered the United States between 1880 and 1910. Their presence profoundly remade the city's ethnic composition, challenged the political machine's apparatus for distributing resources, and deeply unsettled a large contingent of the native-born, who associated the new arrivals with alien and degenerate folkways, as well as destabilizing political strife in an era of growing class conflict. Other elements among the expanding ranks of New York's

native-born, white, middle-class Victorians, however, sought a more harmonious accommodation between the political economy of industrial capitalism and the poor and working-class ethnics who bore the brunt of the period's economic disruptions. From the class of small proprietors, professionals, and higher-up white-collar workers—joined by the occasional interloper from the one percent—emerged the progressivism that became the defining political movement in urban, state, and national politics in the United States from the 1880s to the early 1910s. In particular, a generation of educated women devoted their lives to ameliorating the conditions of immigrant neighborhoods by promoting reciprocity across class boundaries, challenging urban corruption, and searching for ways to curb the abuses of the industrial workplace in New York, Chicago, and other cities across the country.¹³

Yet, even amid so many momentous shifts, New York still seemed to embody the old adage that the more things change, the more they stay the same. Although the city by the 1910s was bigger, busier, and noisier than it had ever been before, the challenges of wealth, poverty, population density, competition for political power, and the unsettling social and cultural implications of everyday life in a dense built environment remained. Population growth, for example, perpetually outstripped the supply of decent housing, whether in the 1840s or the 1890s. When reformer and pioneering photojournalist Jacob Riis published his famed 1890 exposé *How the Other Half Lives*, his descriptions of New York's overpriced, overcrowded, dingy, broken-down tenement dwellings, devoid of natural light and fresh air, hardly seemed to differ from those of physician and sanitary reformer John H. Griscom a century earlier. Indeed, Griscom, too, had invoked the old saying that "one half the world does not know how the other half lives."¹⁴

Other circumstances also tied the antebellum past to turn-of-the-century New York. Although the ethnic composition of the foreign-born and their immediate descendants in the United States shifted over time, overall immigration flowed at a relatively steady rate until the passage of the exclusionary National Origins Act of 1924. Recurrent nativism united the antebellum and postbellum periods as well. The anti-Catholic Know Nothings who attacked Irish and German immigration in the 1850s, for example, had their latter-day counterparts in the generalized nativism of the "nationalist Nineties." Meanwhile, self-anointed reformers alternated between confrontation and accommodation in their relations with Tammany Hall, whether in the 1840s and 1850s, or in the decades after the Civil War. In the 1830s, moral reformers worried constantly about how the relative anonymity of the city allowed

newcomers from the countryside, especially young single men, to succumb to the temptations of drink, theaters, billiard halls, and houses of ill repute. Forty, fifty, and even eighty years later, urban reformers extended their fears to include young working women in addition to young men, and to cover both migrants and immigrants, but their basic concerns remained remarkably similar, and they energetically targeted saloons, dance halls, amusement parks, and “the social evil” (i.e., prostitution) as forces that spread moral depravity and corruption. Meanwhile, endemic poverty persisted alongside ever-expanding riches, and an economically tenuous existence continued to be the norm for most New Yorkers throughout the nineteenth and early twentieth centuries.¹⁵

Concerns with sanitation and public health remained another constant. Amid the notorious filth of antebellum cities, noxious smells emanated from unspeakable sources. The stench from night soil in privy vaults, garbage rotting in piles several feet deep on the streets, manure and urine from horses in an urban setting dependent on horse-drawn transport, and the bodies of animals that died in the city by the tens of thousands (or more) each year blended together to form New York’s rank olfactory environment. During the summer months, voracious insects swarmed in every home, plaguing people as they ate, slept, or breathed. Inadequate plumbing undercut the benefits of Croton water, the supply of which was already insufficient to meet New York’s demands just a decade or so after the completion of the Croton Aqueduct in 1842. Moreover, the inrush of water added to the stresses on the city’s haphazard sewer system.

Such conditions, combined with rapid population growth, exacerbated the threat of epidemic disease. In accordance with miasma theory, most Americans in the mid-nineteenth century associated foul air and putative disease-causing particulates that they called fomites with the spread of infection, which made combating dirt and odor not just a matter of personal comfort, but civic necessity. In the 1840s and 1850s, a young and growing sanitary movement concentrated on eradicating filth for the sake of public health. Sanitary reform continued to gain strength in New York City during the post-Civil War decades, as the city established a permanent public health bureaucracy and ramped up sanitary inspections. In the 1890s and 1900s, the bacteriological laboratory provided sanitarians with new methods and a new source of political authority, which the Department of Health used to help bring about momentous reductions in mortality rates from the appallingly high levels of previous decades. Nonetheless, public health and sanitation re-

mained, as they do to this day, a challenge for municipal governments and a political battleground in class-based struggles over city services.¹⁶

Domestic Animals and Urban Disorder

Amid the turbulence of explosive population growth, ever-mounting filth, increasing mortality rates, widespread poverty, class-based tensions, and social upheaval that defined social and political life in New York City, domesticated animals also defied ambitions for order, calm, and cleanliness. Animals' omnipresence was central to nineteenth-century human ecology. As Susan D. Jones has observed, "Most Americans, whether they lived in urban, suburban, or rural areas, had some daily contact with horses, cattle, poultry, dogs, cats, or other animals that provided food, raw materials, and power for manufacturing, companionship, and transportation." Animals, Jones points out, formed a significant part of the economy, in which nearly 10 percent of factory workers and tradesmen held animal-related jobs, including blacksmithing, meat processing, and the manufacture of wool and leather. In addition to the ubiquity of horse-drawn transport, livestock animals, such as the sheep, cattle, and pigs who awaited slaughter in commercial stockyards or the animals raised right in residential neighborhoods as sources of food, remained a common sight in urban areas throughout the nineteenth century.¹⁷

Conflicts over livestock inflamed the era's already volatile class tensions. As Catherine McNeur has pointed out, already by the 1810s, the city's elites employed a well-established, class-based and racialized discourse about "the swinish multitude" that associated the underprivileged persons who kept animals in order to survive—namely, the city's Irish and African American laborers—with low, animal-like status.¹⁸ Such views continued to shape discussions in the post-Civil War decades. Public health officials, for example, frequently chided the poor for their animal-keeping habits. After the establishment of the Metropolitan Board of Health in 1866 and its successor agency, the New York City Board of Health, four years later, New York's squad of health inspectors targeted the proximity between people and animals among the shanties of the urban poor. Sanitary inspector W. H. B. Post complained in the Board of Health's annual report for 1875 that "a shiftless, careless, filthy class of people" occupied the shanties of the Nineteenth and Twenty-Second Wards. Such persons, he inveighed, "ignore the commonest requirements of decency and cleanliness, living in intimate association with and proximity to dogs, horses, pigs, geese, and other bipeds and quadrupeds, whose habits they assimilate and whose filth commingles with their own."

Post continued, "It is impossible to do anything with these people. . . . [They are] an irresponsible set, against whom a legal proceeding would be worthless, and after a superficial cleansing of the Augean stables, they soon relapse into and wallow in their pristine filth."¹⁹ He and other like-minded inspectors insisted that people who lived with animals became like animals themselves, and no measure of advice, remonstrance, or civic coercion could change their unsavory, uncivilized ways.²⁰

Popular attitudes matched those of public health authorities. An engraving from *Frank Leslie's Illustrated Newspaper* in 1889, in which the newly completed mansions of Millionaire's Row overlooked ramshackle wooden buildings with ducks, geese, and goats happily ensconced on the unkempt ground nearby, alluded to the persistence of animal-keeping among the less privileged despite the best efforts of the superwealthy.²¹ When public commentaries compared itinerant dogs to human drifters and called for the confinement of the former under canine vagrancy laws, they also reinforced class-based notions of disorderly squalor versus self-disciplined refinement.²²

At the same time, the closeness between people and animals in the shanties was but a more exaggerated version of the encounters between humans and domestic animals that occurred daily among all classes in urban America. In New York and Brooklyn, free-ranging pigs still foraged on city streets in the less built-up areas, in part because pigs offered a practical means of garbage control.²³ New York City's Metropolitan Board of Health issued a ban on loose hogs in one of its early acts, but enforcement remained sketchy, and in most American cities, pigs continued to run loose until the end of the nineteenth century.²⁴ Dairy cows also inhabited urban backyards until municipal governments began enacting laws and regulations requiring their removal in the early 1900s.²⁵ New York allowed residents to keep fowl and livestock if they could procure the necessary permits; countless numbers of unsanctioned animals also resided in the city. Goats, whether authorized or unauthorized, sometimes posed a nuisance, such as the herd of more than two dozen that police at the 59th Street station had to round up and capture in the summer of 1874, and they continued to cause problems well into the twentieth century.²⁶ Thousands of complaints annually about foul (fowl?) odors, noise, and pests also spoke to the ubiquity of chicken runs until 1914, when the health commissioner issued new, strict regulations aimed against keeping chickens in densely populated neighborhoods.²⁷

A fuller account of canine animal control, city governance, and American political development will appear in chapter 6. For now, the dizzying array of



“On the Border of Central Park” (1880). Domesticated animals and class conflict in the nineteenth-century city. *Harper’s Magazine*, September 1880. Wallach Division Picture Collection, New York Public Library.

nineteenth-century ordinances and sanitary regulations aimed at domestic animals, including their use, maintenance, and products, simply testifies to animals’ ubiquity in daily city life. In 1859, for example, New York’s city ordinances governed sanitary inspection of slaughterhouses and other facilities engaged in the selling of meat; the cartage and sale of manure; the driving of horses, including speed limits, prohibitions on racing, and rules keeping horses off the sidewalks; the cartage and sale of hay and straw; regulation of tanning, rendering, and other so-called nuisance trades related to the pro-

cessing of animals; provisions for impounding cattle and swine at large; limitations on pig-keeping in pens or sties to three pigs per person between the beginning of May and the end of October; disposal of animal carcasses; muzzling and leashing requirements for owned dogs; and conditions under which the mayor could order the killing of loose dogs. One ordinance even forbade the beating of drums, blowing of horns, or use of other noise-making instruments for the purpose of attracting people “to any show of beasts or birds or other things in said city, under the penalty of ten dollars for each offense.”²⁸

From its inception, the Board of Health also devoted close attention to the regulation of animals’ urban sphere. By 1874, New York’s Sanitary Code covered a broad range of animal-related issues, including the health and care of food animals prior to slaughter; oversight of meat, milk, and other dairy products; prohibitions against any “cattle, sheep, horse, goat, goose, or mule, or any dangerous or offensive animal” running at large; rules against pig- or goat-keeping in the “built-up portions” of the city without a special permit; limitations on the density of the cattle population in the absence of a permit and requirements related to the cleanliness and order of stables; regulations specifying the times of day, streets, maximum numbers of animals, and minimum number of human attendants for driving cattle and other livestock; requirements governing slaughterhouse conditions, the removal and disposal of offal and other animal by-products, and inspection of butchers and milk dealers; mandates related to the city’s animal pounds and pound-keepers; summer muzzling requirements for dogs; immediate killing of mad animals or animals with symptoms of hydrophobia, along with special conditions for the disposal of carcasses; granting of permits for tanning and rendering facilities; regulations governing the storage and removal of manure; prohibitions against bringing diseased animals, or those exposed to contagious disease, into the city; prohibitions against keeping any horse or other equine with glanders; and general proscriptions against keeping dangerous animals or animals that posed a nuisance.²⁹ In its meetings, the Board of Health also spent a considerable amount of time dealing with matters of animal management, including the granting of special permits for animal-keeping, rules for the handling of sick, injured, and dead animals, stable inspection, amendments to the codes governing the driving of livestock through city streets, and the issuance of permits to allow cattle-driving at times and places outside those specified in the Sanitary Code.³⁰

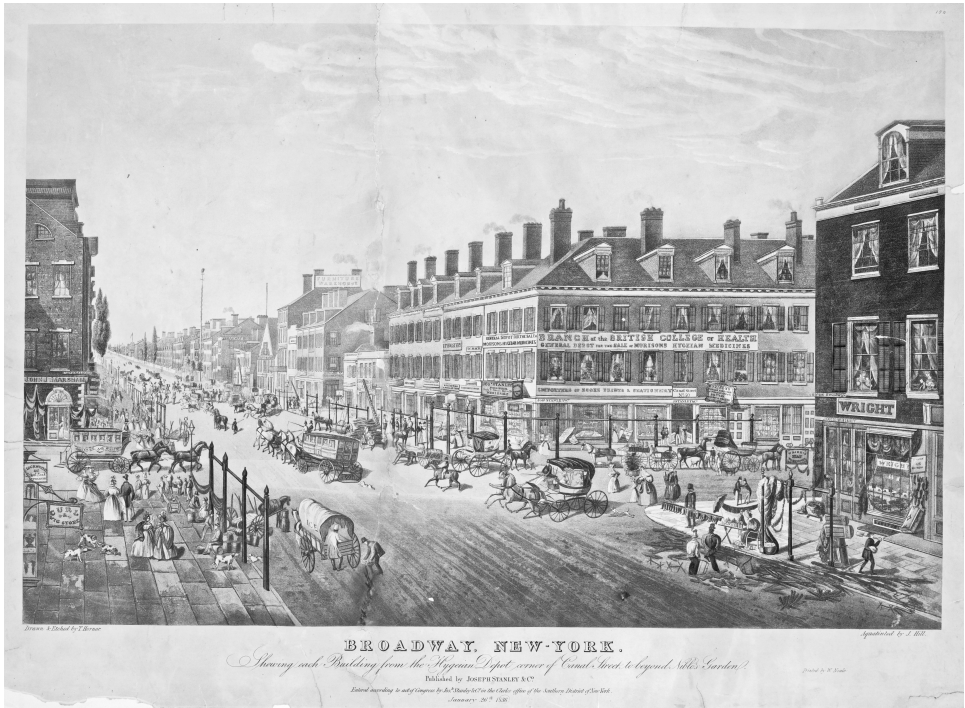
Such regulations spoke to animals’ centrality to the urban economy and infrastructure, as well as the potentially disruptive nature of their presence.

For example, the Board of Health's deliberations over the appropriate routes and times of day for cattle-driving reflected full cognizance of how a stampeding livestock animal could exacerbate dramatically the already robust character of New York street life. In one incident in the fall of 1882, a steer on the loose conjured up a vivid scene of mayhem that captured the entertainment value of public space, as well as the nexus between animals, food supply, and regulation. The animal broke away from a herd of Texas beef cattle headed for the slaughterhouse at 408 East 45th Street, and a crowd soon gathered to watch the chaos that followed. As the *New York Tribune* reported, "The usual excitement which attends a wild-steer chase through the city streets ensued. All the boys along the route hooted and threw stones at the steer, women and small children screamed and ran out of the way, while policemen swung their clubs and shouted without producing any visible effect on the animal." Note "the usual excitement"—the spectacle of a large bovine out of control on city streets was hardly unfamiliar to nineteenth-century New Yorkers. The frightened beast headed southeast, hitting wagons and knocking over a fruit cart as it ran down Second Avenue and onto 34th Street. The youngsters in hot pursuit, many of whom were likely street children out to scavenge for themselves or their families, stopped briefly "to seize the red-cheeked apples that rolled on the pavement." Meanwhile, startled by an elevated train at 23rd Street, the steer turned east. Throughout the chase, one man had been trying in vain to lasso the beast, to the laughs and jeers of the crowd. After he finally managed to snare the animal on 4th Street near Avenue B, following a run of more than forty city blocks, a policeman shot the steer in the head, and a butcher slit its throat. The policeman, however, prevented the carcass' return to the slaughterhouse, citing a law that prohibited removal of a dead animal from the street without a permit. A representative from the slaughterhouse, not wanting to lose a valuable, freshly killed source of meat in an industry that ran on the narrowest of profit margins, then sought said permission from the Department of Health's Sanitary Bureau. The *Tribune* recorded the punitive response of the health bureaucracy: "Sanitary Superintendent Day refused to grant [a permit]. He said that the men who permitted a wild steer to go at large in the city deserved to lose it. The body, he added, would have to be sent to the offal dock, like that of any other dead animal."³¹ Both the police and the health department, it appeared, sought to penalize the slaughterhouse owners for perpetuating the public nuisance that made for a wild Thursday morning on the east side of Manhattan.

Within this nineteenth-century world of human-animal relations, cats and

dogs added still another component to the problem of managing urban disorder. Members of both species, whether owned or stray, generally ran loose on city streets to delight or annoy human passersby, and with few non-human constraints on their population growth, their sheer numbers created annoyances on a daily basis. At night, barking dogs and the raucous serenades of cats “rehearsing popular feline melodies” filled the air, and New Yorkers, along with their Brooklyn neighbors, complained frequently about the impossibility of a good night’s sleep with so much racket.³² Itinerant dogs also filled city streets, to the ire and alarm of human residents. In May 1848, in the midst of reports about rabid dogs killed in New York’s streets, the *New York Herald* cited “seventy-three unmuzzled dogs . . . counted in passing from the lower part of Spring street to the corner of Broadway and Leonard” and warned that “there are now thousands running in the streets without home or master.”³³ Area newspapers described similar scenes in both New York and Brooklyn over subsequent decades. During a major rabies scare in the summer of 1874, for example, the *Herald* counted well over two hundred dogs in a three-hour period during a late-night walk not in the sparsely inhabited far reaches of the city, but “in Crosby, Houston, Bleecker and the intersecting streets.”³⁴ Complaints persisted until well into the twentieth century. As one irritated parent wrote to the *Tribune* in 1914, “My neighborhood is literally overrun at all hours of the day and night with unmuzzled dogs. This morning I came down in the elevator with four of them.”³⁵

The actual number of dogs in New York is impossible to know with any accuracy. Figures from Brooklyn in the late 1870s, for example, spanned from 20,000 strays in 1877 to a police count of just 7,615 dogs in 1879. Later statistics veered just as widely. In 1885, when a reporter from the *Herald* consulted “experts” ranging from dog fanciers to medical and veterinary physicians, they produced figures ranging from 200,000 to 350,000 for New York City’s canine population. At the turn of the century, one estimate put owned dogs in New York at about 75,000, while another less than a decade later pegged pet dogs at 200,000, with strays adding another 155,000.³⁶ Whatever the actual number, nineteenth- and early twentieth-century descriptions of dogs in the streets and regular newspaper reports about dog bite cases testify to dogs’ pervasive urban presence. Working dogs, such as the cart dogs who hauled swill, ash carts, and rag-picking wagons at least as late as the 1870s, sometimes menaced passersby.³⁷ Historians still know little about pet-keeping practices outside middle- and upper-class households, but Katherine Grier has suggested that the keeping of companion animals took place “in all classes, re-



Broadway and Canal Street, 1836. A close examination reveals some twelve to fifteen dogs in this illustration of daily street life in nineteenth-century New York City. Wallach Print and Photograph Division, New York Public Library.

gions, and ethnic groups.”³⁸ Although training manuals already began to advise “civilizing” the dog in the mid-nineteenth century, most pet dogs likely remained free to range alongside their stray counterparts until well into the twentieth century.³⁹ The canine population added its share of trouble to the already vast challenge of managing urban disorder, filth, and the spread of deadly diseases.

Loose dogs collided with humans’ sense of order in multiple ways. Sometimes they spooked the horses that hauled carts, freight, omnibuses, and streetcars throughout the city, or otherwise disrupted human routines.⁴⁰ Their urine and excrement compounded the impassability and stench of city streets, whether in the poorest or wealthiest neighborhoods.⁴¹ New Yorkers, like other urbanites elsewhere around the world, also projected onto stray dogs their fears about crime, gangs, and violence, which took hold of urbanites’ consciousness from the 1840s onward.⁴² The “ill-fed, ill-favored curs” that ran

loose on city streets, the *Brooklyn Daily Eagle* noted in 1863, “are the animals most liable to rabies, and form par excellence the ‘dangerous classes’ of the canine race.”⁴³ Another observer in 1873 similarly opined, “The great mass of dogs to the great mass of men and women in cities are nuisances, petty thieves, vicious assailants and quite an expense.”⁴⁴ For elites and for members of the aspiring middling classes, laments about “rowdy and disorderly curs” paralleled their fears about the “dangerous classes” of people in the Bowery and other predominantly poor and working-class neighborhoods, where the visibility of street children, prostitution, crime, public brawling, intemperance, and other forms of perceived disarray fed midcentury movements to tame the otherwise uncontrollable process of urbanization through myriad campaigns for moral improvement. From a human vantage point, dogs posed a nuisance on their own terms, but as “petty thieves” and “vicious assailants,” they also embodied anxieties about the rough and dangerous character of public spaces in New York and its surroundings.⁴⁵

Dogs thus possessed enormous capacity to foster urban chaos, yet New Yorkers also tolerated their meanderings through the city, partly because they added to the texture and richness of street life despite their propensity for trouble. “A Fulton-st. dog of grave and reverend mien distributes circulars to wayfarers,” read one colorful vignette from 1877.⁴⁶ At times, dog bite incidents provided amusement and not just evidence of the unruliness of an urban existence short on order and propriety. In 1911, the tale of a righteous canine, who “resented [the] action” of two policemen trying to round up pushcart peddlers at Washington and Cortlandt, indicated dogs’ ability to adjudicate conflicts between humans, to the delighted satisfaction of witnesses. Policeman John J. Sexton ended up being hauled off ignobly in a pushcart, for “the damage to Sexton’s trousers was such that it was deemed advisable for him to make a trip in some vehicle in which he could sit down.” The scene elicited much merriment: “The sight of the patrolman in the cart was enjoyed by a large number of commuters, who risked missing their trains. . . . The dog escaped.”⁴⁷

At the same time, human-canine conflicts were never entirely trivial, because of the ever-present threat of rabies. Nineteenth- and early twentieth-century observers voiced surprisingly few concerns about bites from non-rabid dogs, despite the potentially deadly danger of infection in an age before antibiotics. In an era considerably more tolerant of risk than our own, New Yorkers generally viewed ordinary dog bites from the perspective of nuisance, as part of life’s many uncertainties. Hydrophobia, by contrast, posed a

hazard of an entirely different order, one that infused a sense of peril into every encounter with an unruly dog.⁴⁸ When loose dogs frothed at the mouth, suffered fits, or went on the run, crowds scattered and terrified people took refuge behind closed doors. Even by nineteenth-century standards, a potential mad dog was no laughing matter.

Mad Dog! Space, Place, and Panic in the Streets of New York

Remonstrations about urban dogs frequently called attention to both the daily aggravations they caused and the terrifying threat of rabies. In June 1842, the *Brooklyn Daily Eagle* complained about “our streets . . . filled with miserable, half-starved curs, whose dismal howlings ‘make night hideous’” and, in the same breath, called for “a law . . . to shield us from that frightful malady—hydrophobia.”⁴⁹ Nearly three decades later, the case against dogs had scarcely shifted: “[The dog] is the pest of sick people at night, with his unintermittent howling, and is a nuisance to all persons in his neighborhood, well or ill, except his owner. And lastly, he is the propagator of that mysterious horror—the hydrophobia.”⁵⁰ Under the best circumstances, dogs formed a frequently vexatious presence in the city. Under the worst, they transmitted a deadly disease that promised a long, drawn-out, and supremely agonizing death.

At the same time, fears of hydrophobia far outpaced the actual incidence of the disease. Between 1840 and 1906, New York City recorded no more than seven human rabies deaths in any given year.⁵¹ Other illnesses caused far higher mortality, such as the nearly six thousand people in 1849 who died from consumption, “diseases of the bowels,” “inflammation of the Lungs,” or typhus, all “generated by the foul odors of a dirty City.” By contrast, the city inspector noted just seven deaths from hydrophobia during that year.⁵² But fear has never depended on a numerical calculation of risks, and anomalous events frequently attract greater consideration and trigger more intense anxieties regardless of the actual level of threat. As the *New York Times* observed in July 1874, “People are very apt to be frightened about small dangers and careless about great ones. . . . Let one or two men die of hydrophobia, and straightway the symptoms of every rum-sodden patient in public hospitals, who foams at the mouth and shows in death his life-long aversion to water, are transformed into materials for feeding a wild and senseless public alarm.” Meanwhile, the *Times* lamented, diphtheria constituted a far more deadly public health threat, yet it failed to generate similar public concerns.⁵³

The rise of New York’s penny press further amplified the power of rabies to instill excitement and terror. Beginning in the 1830s, cheap daily newspa-

pers, available for purchase on city streets rather than solely by subscription, offered a lively alternative to the respectable and staid business-oriented publications that had previously dominated the news industry. Papers such as the *Sun* and the *Herald* pioneered a new form of reporting that highlighted sensational stories about violent crime, deadly accidents, and other gripping events. As the penny press diversified, other newspapers, such as the *New York Tribune* and the *New York Times*, offered a more measured approach, but they, too, looked for human interest stories that would attract readers' attention.⁵⁴ Rabies fit the bill. As the *Brooklyn Daily Eagle* observed in June 1861, "Every now and then a thrill of horror is sent throughout the frame of society on reading some horrible case of hydrophobia terminating in a terrible death struggle."⁵⁵ New York's newspapers happily provided that sense of chilling entertainment, with reports of mad dog scares and hydrophobia deaths, whether they occurred locally, upstate, nationally, or around the globe.

Those countless stories provide the means for reconstructing the history of dogs' place in the city and the commotion surrounding human encounters with dangerous dogs on the run. Short news snippets regularly informed New Yorkers about the appearance of suspicious-looking canines in the city and in neighboring jurisdictions, especially in summertime. Popular belief taught people to associate rabies with the dog days of summer, even though data gathered as early as the mid-1850s demonstrated its year-round occurrence. Newspapers perpetuated the seasonal myth by accelerating their rabies coverage during the summer months. A typical story might note the dog's path, the people it encountered, whether or not it bit anyone, and the fate of the dog. As the *Tribune* reported in July 1845, "A dog was killed yesterday morning, after having shown symptoms of hydrophobia. He ran through several of the streets in the lower part of the City, and finally went into the store of Mr. Noyes, No. 41 Pine-st. where he was killed by some citizens." The brief news item ended by noting another suspicious sighting: "We saw a dog in Nassau-street that badly wanted killing."⁵⁶

Similar stories appeared every year for decades, and they convey something of the flavor, texture, and rhythms of city life from the mid-nineteenth to the early twentieth century as well as the ubiquity of dogs and the anxieties they engendered. Over the decades, in New York and its surrounding suburbs, snapping and growling dogs harassed pedestrians, threatened policemen on the beat, bit children at play in the streets or in schoolyards, terrified women and children queued up for ice, and panicked shoppers along the crowded thoroughfares of Broadway. They invaded police stations and other

public buildings, tenements, shops, hotels, saloons, schools, and churches; they sent manual laborers digging pits and subway tunnels diving for cover, and they scattered commuters waiting at ferry terminals.⁵⁷ Such reports, which appeared regularly over the decades, reminded readers to maintain alertness when, seemingly at any moment, the simplest events of daily life might erupt into chaotic confrontations with snarling, aggressive, and potentially rabid dogs.

Beyond their own devices, city residents could also rely on policemen, who frequently intervened to dispatch dogs, either by club or revolver. Much scholarship has documented the endemic lethargy and corruption of New York's police force during the nineteenth century, but individual officers did seem capable of killing dogs when called upon to do so; one also suspects many of them enjoyed an excuse to discharge their firearms. When "a large and valuable dog" out with its owner on an ordinary walk along the Battery appeared "attacked suddenly with hydrophobia" in the summer of 1858, a policeman matter-of-factly "put an end to its disagreeable pranks by shooting the animal in the head with a revolver."⁵⁸ Similar scenes reproduced themselves over the decades, whether in workspaces or on city streets. In 1890, for example, on a late summer day in Brooklyn, a tinsmith at work at his bench suddenly found himself with a strange dog at his feet who "began to froth at the mouth and growl in a threatening manner." The terrified artisan crashed through a window, "taking the window glass, sash and frame with him" in order to escape. He then summoned a policeman who, when rushed by the dog, fired off five shots before finishing off the animal with a crowbar.⁵⁹ Other comparable incidents testified to both dogs' threatening presence as well as the ability of the police to intervene.⁶⁰

Most such encounters took place under fairly contained circumstances involving a handful of people and a relatively limited physical space. In theory, rabid dogs could cover twenty miles or more and wreak havoc wherever they paused to bite humans or other animals. Various news reports, such as the story of a mad dog in Walton, Massachusetts, who traveled some twenty-five miles before expiring, backed up the literature on veterinary medicine. In one extreme case, a rabid greyhound in upstate New York, in an impressive display of its breed's ability to run, reportedly ranged eighty miles and bit dozens of other dogs, as well as horses, cattle, and people, as it rampaged across the countryside.⁶¹

In densely populated areas, suspected mad dogs could not go as far before being killed, but they sometimes managed to cover distances ranging from

multiple city blocks up to several miles, and they disrupted daily activities and held neighborhoods hostage to fear for extended periods of time.⁶² When wild-eyed dogs ran loose in crowded public places or densely populated neighborhoods during the busiest times of day, large, spontaneously formed posses sometimes gave chase. In an era defined by its buoyant and varied street life, particularly in densely populated working-class districts where cramped tenements allowed little in the way of a division between public and private space, streets were more than mere thoroughfares or places to shop. They provided critical spaces for work, leisure, and sociability, and residents of New York and its surrounding areas took a lively interest in experiencing and maintaining what Christine Stansell once evocatively described as “the uses of the streets.”⁶³ One incident involving a Newfoundland in Brooklyn in June 1888 amply illustrates the nature of mass participation in daily neighborhood life. The dog, which was about to be killed because its owner suspected it had rabies, evaded its captors at a stable on South 6th Street and went on the lam. According to the *Brooklyn Daily Eagle*, “The animal escaped from 100 armed men,” ran into a nearby apartment building, made its way into a top floor unit, and ended up jumping out of a top floor window. By then, an even larger crowd had gathered to watch the event unfold. “Over five hundred persons witnessed the descent,” the *Eagle* reported, “and they scattered in all directions, some dropping their clubs in their flight.”⁶⁴ Skepticism about crowd estimates aside (a hundred armed men to dispatch a single dog?), the basic point remains: multitudes of people might gather to witness outbursts of local excitement, to participate in the communal frenzy of chasing down a mad dog, and even to savor the thrill of fleeing for their lives.

Scenes of urban mobs in hot pursuit of mad dogs reflected community obligations for the maintenance of public safety, as well as the entertainment value offered by raucous events that added to the liveliness of urban life. Mad dog scares on heavily used promenades occurred frequently enough to function as a form of public theater. Although the chase might be left to the police in foul weather, on a fine day with crowds out and about, larger groups of people performed their expected social roles on the stage of the streets.⁶⁵ In accordance with gender norms, men who took up cudgels acted as male protectors of women, family, community, and public safety. Women typically screamed and ran, shielding their children as they escaped; unarmed men also frequently beat a hasty retreat. Unsupervised children, especially boys who used the streets for both work and play, merrily joined the commotion

of the hunt, and they and their adult male counterparts threw sticks and stones at their unfortunate canine targets. Meanwhile, adult onlookers congregated at a safe distance to gawk, jeer, enjoy the thwarting of human will by a lowly animal, or experience the chill of a close encounter with rabies. In one instance in 1891, a prolonged chase in the predominantly Irish Hell's Kitchen section of Manhattan even ended with a triumphant promenade of the dog's corpse, which "was carried from throng to throng" before being "deposited on the short wooden stoop of Blitz the shoemaker," the dog's owner.⁶⁶

Indeed, animal suffering and related sights offered intriguing diversions. In a social context of animal welfare advocacy's relative novelty (the American Society for the Prevention of Cruelty to Animals was founded in New York City in 1866), organized cockfights, dog fights, and other blood sports still allowed men to indulge in rough pleasures free from the strictures of genteel notions of refinement. Within this cultural setting, the rounding up of strays, killing of suspected mad dogs, and disposal of corpses offered not just means of alleviating a public danger, but forms of spectacle that entertained even as they revolted. Hence in mid-June 1874, a crowd gathered in Brooklyn to watch a policeman kill a local farmer's two dogs after they developed rabies symptoms, while a week later the removal of dog carcasses from Manhattan's city pound attracted "a curious crowd of street urchins, who retracted their steps, however, as soon as they came within smelling distance of the dock."⁶⁷ On another occasion in the late 1880s, a dog-hating Brooklyn homeowner solicited the help of a policeman in hanging a stray yellow mongrel who seemed ill. The incident took place in a respectable neighborhood "lined with handsome residences," and "scores of people" gathered to watch, including "many ladies, who were much distressed and disgusted." The embittered executioner, however, reportedly "laughed when the cur's struggles ceased and he said, 'There dies another Anarchist.'"⁶⁸ On another occasion, when "a dog showing signs of rabies" took "sole possession of a yard" in the back of a Williamsburg tenement for three hours, residents watching from their windows enjoyed making "beer and sode [*sic*] water bets on how many laps he would make before crossing diagonally from one corner to the other." Eventually, a policeman came to put an end to the day's entertainment.⁶⁹ Such accounts pointed to the class dimensions of popular amusements: the pretension of disgust in a refined stretch of Brooklyn versus the gaiety of the tenement yard.

As these incidents indicate, spectators gathered not simply to register satisfaction at a public danger removed, but to ogle at freakish displays of the

bizarre, as part of an urban popular culture in which New Yorkers found grotesque entertainments not just in the world of Barnum or, in later years, Coney Island, but in the everyday life of the street. Suspected mad dogs, by punctuating ordinary routines with bursts of excitement, created public spectacles that amused even as they frightened and repelled. In New Yorkers' leisure spaces, both within the city itself and in neighboring regions, cries of "Mad dog!" sparked particularly raucous scenes of disorder that speak to the unpredictable environment surrounding urban pastimes. The city's nightlife provided one such venue for canine-inspired pandemonium. In June 1899, for example, "a mad dog, or one with many of the symptoms of hydrophobia," spread terror among the crowds enjoying the diversions of the Tenderloin. Around 3 a.m., the dog showed up in front of Proctor's Theatre on West 23rd Street, where it "caused a panic among the hundreds of persons who were in and around the place." The animal then dashed into a saloon, where customers hastily sought protection on top of the bar or on billiard tables while the establishment's three bartenders speedily granted the dog the "undisputed right of way." It next stopped at the Bon Ton Music Hall, where "soubrettes and performers deserted the stage and patrons ran in every direction, calling for help." The evening's excitement ended when a policeman, who had been in hot pursuit the entire time but without the chance for a clear shot, finally cornered the dog in an empty hallway and killed it.⁷⁰

In parks and other outdoor expanses, scenes of daytime leisure and amusement could also erupt into wild moments of panic as crowds scattered before dogs on the rampage. The second half of the nineteenth century witnessed the development of spacious outdoor venues for public relaxation in New York City and its surrounding areas, starting with Central Park and Prospect Park in the 1850s and 1860s. In the 1870s, Coney Island and other beachfronts beyond Manhattan became increasingly attractive and accessible to the masses with the expansion of the rail system and then, by the 1890s, the rise of entertainments designed to attract a broad spectrum of city dwellers, including women and families. In these settings, suspected mad dogs could easily scare hundreds of people in short order. On Gravesend Beach, which brought in weekend crowds of up to a hundred thousand during the last decades of the nineteenth century, a policeman's terrier generated a panic when it "evinced signs of madness and began to snap at several children." A crowd gave chase, with men and boys throwing sticks and stones, until they finally clubbed and stoned the dog to death.⁷¹ In smaller parks, such as Union Square or Corlears Hook, loose dogs also sometimes attacked and terrified



“A Sun-Bath” (1895). Dogs and New York’s leisure spaces. *Frank Leslie’s Popular Monthly*, August 1895. Wallach Division Picture Collection, New York Public Library.

large throngs of people.⁷² On one occasion in Central Park, “a rabid big yellow dog” charged at the deer enclosure before heading toward the Arsenal and sending women and children running for their lives.⁷³

No popular destination produced more vivid scenes of canine-induced upheaval on multiple occasions than Coney Island at the turn of the century. Coney first emerged as a resort area in the late 1820s, but lack of inexpensive and efficient transportation limited its clientele until the 1870s, when street-car lines and cheap steamships brought down the cost of getting there from Manhattan to as little as a nickel. With easy access, Coney became an outing of choice for working-class excursions, and by the late 1870s, its beaches, bathhouses, dance pavilions, restaurants, saloons, and sideshows attracted sixty thousand visitors a day throughout the summer. Its reputation for vice and overly risqué, male-oriented activities, however, particularly on the rough

west end, a center of gambling and prostitution, set limits on Coney's appeal. One account of a typical bright summer day at Coney in 1878 conveyed the era's low expectations for good human behavior when it noted "unusually attractive" conditions at the beach thanks in part to the lack of "disagreeable or disorderly people." The situation shifted in the 1890s, however, when developers eager to attract more visitors began to offer new forms of entertainment, particularly in the amusement parks, that were still daring enough for fun, but that also passed muster for women and families. With these changes, Coney Island's already large crowds grew to 300,000 to 500,000 people on summer weekends and holidays by the tail end of the nineteenth century.⁷⁴

Mad dog scares on Coney Island provide glimpses of daily life at the popular resort in addition to evidence of dogs' capacity to disrupt leisure time in public places. In July 1897, a large black dog of unknown origin sent crowds "running for refuge in all directions" on a busy summer day that also included two drownings, a fistfight on the Iron Pier between a judge from Newark and a bricklayer from New York City, and a number of arrests of barkers for creating a public nuisance. Several years later, a fight broke out among a troupe of eighteen performing collies who were supposed to be resting. The dogs escaped from their pen, and predictably, "a wild stampede" of women, children, men, and dogs ensued. "Some of the beasts," the *New York Times* added, "seemed to have been made mad by the excitement, and fears of hydrophobia added to the terror of the fleeing crowd." In another incident in August 1907, a hotel guest's pet dog suddenly began "yelping and snapping right and left," and women and children along 22nd Street scrambled to get away. The dog managed to bite at least eleven people, including nine children, before a policeman's bullet ended its rampage. Three years later, a local resident's St. Bernard similarly frightened beachgoers and fomented chaos. On Coney Island's west end in the summer of 1911, a mastiff-sized white dog appeared out of nowhere, bit a fourteen-year-old boy, and went on to attack other children as well as several dogs belonging to locals until policemen chased it under a house and fired multiple shots to kill it. The corpse was sent for laboratory analysis; subsequent newspaper issues did not record whether or not the dog had rabies.⁷⁵

Beyond the common pattern of rampaging dog, panicked crowds, police response, and, finally, the killing of the animal, these events on Coney Island convey insights into the nature of dogs' place within New Yorkers' leisure spaces. Dogs lived and worked on Coney, accompanied human visitors, and

even stayed at hotels. They also gaddled about on their own, either because they were strays, or their owners let them wander unconstrained in accordance with standard practice at the turn of the century. Dogs, whether rabid, mean, or simply rambunctious, sometimes disturbed the peace of Coney Island, but so did accidents, fights, and other human activities. Public spaces crowded with humans and dogs alike bred opportunities for disorder.

Just how many of the animals involved in these everyday mad dog scares actually had rabies is impossible to say. Epilepsy, distemper, and other medical conditions caused similar symptoms, and as we will see in later chapters, the problem of diagnosis and inflated fears troubled physicians and animal welfare advocates alike. In an era of low standards for training and discipline of pets, healthy owned dogs might display aggression or run about uncontrollably while out on city streets, even if accompanied by a human companion, while strays acted in accordance with their instincts.⁷⁶ “A wild, though not rabid, dog,” such as the one who bit and snapped at workingmen, a night watchman, sailors, two reporters, and every other human it encountered during the wee hours of a winter morning on the west side of Lower Manhattan in 1881, could cause just as much mayhem as a dog with rabies.⁷⁷ Over the years, New Yorkers debated over just how many mad dog panics involved real cases of rabies. In 1869, the *New York Tribune* noted that “it is easy to mistake an enraged dog for a ‘mad-dog;’” but the paper also found the number of rabid dogs not greatly exaggerated at a time when the city and its surrounding jurisdictions faced a dangerous hydrophobia outbreak. By contrast, animal welfare advocates at the turn of the century liked to claim that less than one in fifty dogs supposed rabid actually had the disease, and they lamented the frequency with which children taunted dogs into aggression, an impression often backed by news accounts. Public health officials, however, cautioned against complacency, and after the development in 1905 of techniques for the rapid diagnosis of rabies through pathological examination of brain tissue, the health department began to release statistics. In 1908, another year of a major rabies outbreak in New York City, health department veterinarians examined more than 4,600 dogs suspected of having rabies, referred 250 for laboratory diagnosis, and found rabies in 104 instances.⁷⁸ That year’s statistics showed a high ratio of concern to definitive cases, with less than one in forty-six dogs examined found rabid, a figure not far from animal welfare advocates’ ballpark estimates. But a hundred rabid dogs could easily expose hundreds of people to deadly disease if left to their own devices. Moreover,

a vicious dog constituted a public nuisance as far as the law was concerned, and such animals shared the same fate as mad dogs—namely, if caught, death by clubbing or shooting.

At first glance, mad dog panics testify to a tumultuous urban world of exaggerated fears and unruly street life in the nineteenth and early twentieth centuries. Beneath these surface appearances, however, order of a sort prevailed. Definitive social patterns based on age, gender, and class played key roles in determining which humans and dogs came together on the streets of New York.

Gender, Childhood, Species, and the “Uses of the Streets”

Beneath the general and episodic descriptions of dogs on the loose and the havoc they caused lay specific social conditions that set the stage for inter-species encounters and the spread of rabies. For example, as already discussed, whether a mad dog ran in an urban or a rural area imposed constraints on how far it could expect to travel. Rabid dogs in the countryside also had greater access to other domesticated animals, including costly livestock, which made rural rabies an agricultural problem, as opposed to primarily a matter of public health. Tellingly, by the turn of the century, the state Department of Agriculture handled governmental responses to rabies outbreaks upstate, while the municipal Department of Health monitored conditions in New York City.⁷⁹ In urban settings, gender- and age-based differences in humans’ use of space shaped contact between people and dogs, and, by extension, human susceptibility to dog bites and rabies. In particular, women’s more cloistered and protected lifestyles shielded them from aggressive dogs, while boys’ behavioral patterns and everyday lives in the open rendered them more vulnerable to dog bites than any other major social group. Class status and how it played into participation in public life further complicated the circumstances of potential rabies exposure. Although dogs’ own perspectives remain mysterious, their place within human society also affected their epidemiological status, both real and imagined. Despite the predominant image of the roving, misbegotten stray cur as the overwhelming source of canine threats to human health and safety, owned dogs accounted for a significant portion of dog bite cases.

As Neil Pemberton and Michael Worboys have noted with regard to the English physician and medical statistics pioneer William Farr, nineteenth-century treatises identified gender and age as powerful components of the epidemiology of rabies. Among dog bite cases in England, France, and the United

States, hydrophobia deaths among men vastly outnumbered women. Horatio Bigelow's *Hydrophobia*, the first major American treatise on the subject, noted that "out of eighty well authenticated cases, from 1849 to 1879, seventy were males and ten were females." Distinguished French veterinarian Henri M. Bouley's well-known lecture on hydrophobia, which the prominent New York veterinarian Alexandre F. Liautard translated into English for American readers, found a less skewed sex ratio in data gathered for France's Consulting Committee of Public Hygiene. Even so, men were more than twice as likely to be bitten than women, and male hydrophobia cases outnumbered female cases by more than three to one. Cultural norms, Bouley believed, accounted for the difference. Women, he wrote, "are less exposed, in consequence of their habits and of their household work, to be met by mad dogs; and when exposed to their rage, the character of their clothing offers a means of protection." Bouley also found that children between the ages of 5 and 15 were more likely than adults to suffer dog bites, which he attributed to "the age of imprudence, weakness, play, and teasing," but they were less likely to develop rabies. In accordance with widely circulated nineteenth-century ideas about the relationship between mental states and disease, he postulated that children enjoyed less susceptibility, "protected as they probably are by their natural freedom from anxiety, and, consequently, by perfect mental quietude." Although Bouley recognized children's propensity to tease, he apparently missed the simpler explanation that they probably suffered a far higher incidence of bites from healthy dogs and therefore contracted hydrophobia at a lower rate than adults. He did, however, recognize the social circumstances that brought dogs and children together, namely, that "dogs will meet more children than other persons in the streets and lanes where they collect to play."⁸⁰

The New York City Department of Health did not collect dog bite statistics until the early twentieth century, and even then, it did not break down the data according to age and gender. Newspaper coverage, however, upholds the general trends identified in the medical treatises, and data derived from dog bite stories in the *New York Times* during the decades of the 1860s, 1880s, and 1900s supports the stark gender and age differences in vulnerability to dog bites that nineteenth-century treatises identified.⁸¹ Over the three decades surveyed, men outnumbered women in the greater New York area as victims of dog bites by a ratio of more than three to one. The difference is even stronger when one takes into account the skewed gender ratios of the time period. In antebellum New York, particularly among young people, labor

markets drove men to seek work beyond city limits while women stayed behind. Gender ratios remained uneven, although by smaller margins, toward the end of the nineteenth century.⁸² The numerical gap between news reports of 163 children and 156 adults bitten by dogs might not seem dramatic at first glance, but in 1860, the 15-and-over population in New York and its surrounding counties ranged from 70 to 90 percent larger than the under-15 population. The gap widened over subsequent decades. By 1910, adults outnumbered the under-15 population by nearly two and a half to one in New York City, with ratios on a similar scale, although slightly smaller, in nearby Jersey City, Newark, and Paterson, New Jersey. By that reckoning, a child's risk of dog bite was probably more than double that of an adult's by the 1900s, with boys far more likely than girls to be bitten.⁸³

Children's heightened historical vulnerability likely stemmed in part from the same sources as today, namely, children's smaller size, inability to recognize dogs' dominance hierarchies, and lack of caution toward animals.⁸⁴ In an age of relatively low expectations of self-discipline on the part of both children and dogs, harassed pets or annoyed dogs on city streets regularly snapped at and bit children, sometimes in response to deliberate teasing and at other times with little or no provocation. Beginning in the 1820s, middle-class, Victorian advocates of an ethic of kindness to animals highlighted in particular boys' propensity to mistreat their four-footed friends, and they sought to impress upon children the need for a gentle attitude toward nature's creatures. Just how far such attitudes spread throughout the middle class over subsequent decades is difficult to say, however, much less among working-class families. Commonplace stories of city children bitten by dogs that they taunted indicated the still limited reach of animal welfare advocates' didactic project in the early twentieth century.⁸⁵ Other incidents, such as dogs on leash or in yards that attacked children passing by, testified to owners' lack of control.⁸⁶

But in the nineteenth- and early twentieth-century city, children, especially boys, also faced greater risks of dog bites because of the basic reality that they shared the streets with dogs to a greater extent than any other group of humans. As Christine Stansell once observed, "The teeming milieu of the New York streets in the mid-nineteenth century was in large part a children's world." During the antebellum period, working-class and poor families required children's income, but declining apprenticeship opportunities for boys and a shifting labor market that replaced girls with immigrant women in domestic service forced children into scavenging, peddling, news-

paper selling, and other street trades. Parents tended to keep a closer eye on girls, whom they feared would become victims of sexual assault or enter into prostitution, but they frequently allowed boys to live out of doors for weeks on end.⁸⁷

The outdoor lifestyles of urban children persisted for decades. Throughout the second half of the nineteenth century, poorly enforced compulsory education laws failed to keep New York City's children off the streets. Although expanded systems of municipal garbage removal discouraged scavenging, a wide variety of other street trades remained open.⁸⁸ According to Peter C. Baldwin, children who attended school also still had plenty of hours left for work or play out of doors, and an increasingly vibrant adult nightlife gave them new opportunities to sell newspapers and other goods to passersby, or simply to enjoy people-watching. In addition, mothers trying to complete household tasks in tight quarters expected their children to stay out of the way by keeping themselves occupied outside. Consequently, New York's immigrant, working-class neighborhoods overflowed with youngsters in the afternoons and evenings. Urban reformers' efforts to create adult-supervised forms of recreation and to enact urban curfew laws and other regulations over children's street trades in the 1900s and 1910s further demonstrates the continuity of children's presence in the streets well into the twentieth century.⁸⁹

An urban social geography in which both dogs and children roamed unsupervised in their outdoor lives inevitably led to interspecies clashes. We have already witnessed boys' eagerness to join adult men in giving chase when suspected mad dogs tore through New York's public spaces. Other newspaper stories about children's encounters with dogs conveyed the centrality of the spaces in front of family homes, candy stores and other storefronts, in schoolyards, and on city streets to the experience of childhood. "Yesterday morning a dog attacked and bit a little girl in Fortythird-st.," the *New York Tribune* tersely reported in the summer of 1855. In 1858, 11-year-old Patrick Madden was at work driving hogs in Brooklyn when a rabid dog attacked. Six weeks later, he contracted hydrophobia and died.⁹⁰ As the decades passed, children bitten while at play out of doors were among the most common hydrophobia victims.⁹¹ Youngsters approached strange dogs all too readily, with lamentable results. In 1905, for example, neighborhood children on Norfolk Street, on the Lower East Side, befriended a stray dog and fed it for several days, until the dog developed rabies symptoms and seriously wounded some of the children.⁹² Nor did school attendance guarantee safety from dogs on

the loose. Suspected mad dogs sometimes attacked crowds of children at play in schoolyards or menaced pupils on their way home.⁹³ Newspapers also recorded occasional stories of young children attacked by dogs as they left candy shops, the neighborhood fixtures where pennies fulfilled modest fantasies of consumption.⁹⁴ Such incidents demonstrated the potentially volatile consequences of children's and dogs' autonomy within shared spaces.

By contrast, women led far more sheltered lives in the nineteenth and early twentieth centuries. Restrictions on women encompassed not just limits on political rights or economic opportunities, but also more basic boundaries on freedom of movement in daily life. According to mid-nineteenth-century mores, women who aspired to propriety and social status did not appear in public places without a male escort. Catcalls and other forms of harassment also deterred women from walking New York's streets on their own in the early decades of the nineteenth century. Accounts from the 1830s to the 1850s detail how even a simple visit to a post office required a determined woman to cross an unruly gauntlet of boys and men. Most women understandably preferred to avoid such male-dominated spaces whenever possible, and a substantial advice literature cautioned them to do so if they wished to maintain their respectability.⁹⁵

These constraints on women's presence in public gradually eased over the following decades, but never entirely disappeared in the years prior to World War I. Central Park, for example, both challenged and reinforced dominant ideas about women and their place in the physical spaces of the city. The designers and boosters who dreamed of a grand new park as a means of cementing New York's world-class status also imagined the creation of a genteel environment that would be safe for women and discipline all visitors into a state of refined behavior. Even so, when city dwellers first flocked to Central Park in December 1858, high society still deemed it mildly scandalous for a woman to walk there alone, although that sense of opprobrium began to dissipate within a few years. In the 1870s, newspapers continued to grumble that women properly attended the park only with an escort, but by the 1880s and 1890s, women felt freer to explore on their own.⁹⁶ Yet, resistance remained even at the end of the nineteenth century. For example, Charles E. Rosenberg has written about the prickly, arrogant, and inveterately status-conscious physician John Sedgwick Billings, who fretted in 1898 about his wife's desire to walk alone with their baby in Central Park. In a letter to her mother, Katherine Billings objected to her husband's attitude, not on the

grounds that such notions were outdated, but that in a year and a half of life in New York, "I never met anybody on the street that I knew," and therefore she faced a low risk of inviting the scorn of the Billings's social set.⁹⁷ Although Katherine thought the benefits to the infant's health outweighed the risk of detection, both members of the couple apparently agreed on the *déclassé* nature of a lone woman in public with a baby in tow.

The streets were somewhat more open to working-class women, partly out of necessity and partly because working-class folkways allowed a more uninhibited public life for both men and women. Cramped housing moved the social lives of poor and working-class women outside tenement doors and into the streets. Economic conditions also required countless women to earn wages, either to support themselves or to contribute to the family economy, although direct exposure to city streets varied with occupation. On the one hand, women's paid labor did not necessarily require much time outside the home. Despite the rapid expansion of factory work starting in the mid-nineteenth century, tenement households remained sites of production in the needle trades and other forms of manufacturing well into the twentieth century, which allowed women's wage labor to stay within the family dwelling. For those who assembled clothing in New York's garment industry, factory production did not begin to replace tenement sweatshops in a serious way until the early twentieth century. Other trades continued to rely on the putting-out system, in which laborers assembled products in cramped, badly lit, and unsanitary tenement households. In 1912, the New York State Factory Investigating Commission found at least a hundred different occupations, including such varied activities as brush-making, nut-picking, coffee-sorting, coil-winding (for electrical coils), and lace-making, that still depended heavily on poorly paid home work by women and their children.⁹⁸

Other jobs beyond the household minimized women's exposure out of doors. Domestic service, which dominated women's employment in the antebellum period and remained a prominent occupation for women in the post-Civil War decades, usually included room and board, and thereby kept young, working women out of public view. Jobs in print shops, behind store counters, and in factories, or, by the latter decades of the nineteenth century, white-collar office work, required women to traverse city streets only for the journey to and from work. Street peddling and streetwalking were among the handful of women's occupations that mandated a steady presence outdoors. Tellingly, the antebellum moral reform organizations that provided aid to

widows with children forbade their clients from working as street peddlers, a trade that took women out of the home and exposed them to the gaze of strangers.⁹⁹

On the other hand, even indoor work allowed a more public life for working-class women who, as Kathy Peiss has argued, actively shaped a larger process of cultural change that expanded women's visibility in society through their own pursuit of earnings and leisure.¹⁰⁰ Although some places remained strictly off-limits to young women, a boisterous, heterosexual youth culture took root in the Bowery and other locales in antebellum New York, and factory work also brought growing numbers of young women into new social spaces where men and women interacted on a daily basis outside the setting of home and family.¹⁰¹ The entry of working-class women into public and semipublic spaces expanded further in the second half of the nineteenth century, as young, working women eagerly partook of new commercial amusements and sought jobs in factories, department stores, and offices, rather than in the more sheltered realm of domestic service.¹⁰²

Even so, in the early twentieth century some working-class women, particularly those who were married, still faced significant restrictions on their movements beyond the household. Italian women, for example, rarely worked outside of the household after marriage. As one Italian mother informed an interviewer with Mary van Kleeck's study of the artificial flower industry, she made flowers at home under the putting-out system rather than taking a higher-paying job at a candy factory because "we can't go out to work after we're married."¹⁰³ New York City's tenement-based manufacturers took ready advantage of such preferences, and between work and family responsibilities, mothers frequently had few opportunities to leave their homes. As Peiss notes, New York settlement worker and reformer Henry Moscovitz observed in the early 1900s that many mothers on the Lower East Side barely got out of their apartments more than twice a week, and Italian women led particularly cloistered lives. When they did venture out onto city streets, they regularly faced unwanted male attention, particularly from bar patrons and loiterers.¹⁰⁴ To that extent, city streets still remained forbidding for women in the early decades of the twentieth century, despite two generations of urbanization and social change.

As Bouley sensed in his treatise on hydrophobia, the highly gendered dimensions of urban space strongly shaped women's risk of exposure to dogs and rabies. Women simply spent less time in open spaces where they might encounter strange and menacing dogs, and when they did, they could often

count on protection from a male companion, or they could rely on the men and boys who appointed themselves to chase down suspected mad dogs. Significantly, women were far more likely than men to contract hydrophobia from known dogs than from those that went unidentified. For example, in statistics drawn from the *New York Times*, four out of the five New York area women who died from rabies in the 1900s were bitten by their own pets, as opposed to only about half of the twenty-three adult male rabies victims.¹⁰⁵ Even in their relationships with dogs, women to a far greater extent than men lived among family members, friends, and acquaintances, and not in the urban world of strangers that so worried nineteenth-century American moral reformers.

Dogs, Disease, and Civilizational Anxiety

Beyond the turbulent material world of social relations that defined human-animal encounters on the streets of New York City lay the cultural assumptions and images that city residents employed to think about dogs, disease, and the challenges of urban life. In addition to the class-based metaphors discussed earlier that associated the low moral condition of the “vicious and disorderly classes” with their close proximity to domesticated animals, the unease surrounding dogs, disease, and the seeming civilizational tenuousness of the city itself spurred outsized fears of rabies. Perhaps no single word carried more cultural baggage in the United States at the turn of the century than “civilization.” With this one term, Americans encapsulated myriad anxieties about industrialization, urbanization, health, race, immigration, and nation. When American intellectuals and opinion makers looked at urban life, they saw an alarming dystopia of declining human vigor and a rising tide of nervous disease, insanity, criminality, and feeble-mindedness, whether derived from biologically inherited weaknesses or a fast-paced, modern existence that preyed on tattered nervous systems.¹⁰⁶

By the last third of the nineteenth century, fears of canine-borne infection melded into generalized qualms about the perils of civilization, as anxieties about social and biological upheaval metastasized into frightening scenarios of bodily decline and racial degeneration. In this setting of civilizational angst, dogs and the social disorder that accompanied them came to signify the barbarous state of the city and the devolving condition of its inhabitants. A commentary from the *New York Tribune* in 1866 heralded the shape of things to come. The “starvelings” that composed New York’s stray dog population, the *Tribune* warned, not only threatened hydrophobia, but “suffer a

demoralization corresponding to man's being nearest him in civilization, and the degradation of both is attended with all disorders."¹⁰⁷ Local political leaders also pointed to dogs as evidence of deteriorating public mores. As Brooklyn Corporation Counsel William C. Dewitt declared in 1874, "The presence of any damned mongrel in this city is a disgrace to the civilization of the time." His sweeping condemnation included not just stray dogs, but the "women who keep their spitzes and their poodles," and consequently "deserve such punishment as civilized society inflicts on indecent exhibitions anywhere."¹⁰⁸ The *Brooklyn Daily Eagle* backed Dewitt with regular attacks on dogs as a source of civilizational decay in the 1870s and 1880s. Hydrophobia deaths, the *Eagle* contended, underscored dogs' menace to enlightened values. As the *Eagle* concluded in July 1881, because hydrophobia was "so essentially a disease resulting from the folly and selfishness of others," it therefore constituted "a black mark upon our boasted civilization."¹⁰⁹ Area newspaper readers drew similar conclusions about dogs and disease. In 1890, for example, *Tribune* reader "F.S.D." called attention to the dwindling numbers of other domesticated animals in the city and asked, "Is it not time to take care of the dog as we have taken care of all other animals except the cat, the twin relic of barbarism?"¹¹⁰ In an age obsessed with civilizational ranking, stray dogs provided a measure of overwhelming deficiencies in sanitation, public morality, and civic spirit that signaled the city's fallen state and utter failure to embody the advancements that marked a civilized society.

The intense, racialized discourses surrounding anxieties about urban degeneration added fuel to the fire. In a culture in which the specter of racial decline loomed large in the white, Anglo-Saxon imagination, loose mongrels on city streets seemed to provide ready evidence of the biological declension that threatened American national vigor. As the *Tribune* speculated in May 1877, if hydrophobia ever emerged spontaneously in dogs, "it is probably so oftenest in the curs 'of low degree'—the street-pariahs of the race. Good blood tells in this as well as in the other matters of discretion, intelligence, and affection."¹¹¹ The *Brooklyn Daily Eagle* similarly sensed the dangers of low breeding. According to the *Eagle* in July 1879, the stray dog "roams the streets and degenerates. He breeds mongrels, and loses all the noble characteristics that make him tolerable. He is no longer the intelligent friend of man, but a pest and a nuisance. His appearance is filthy, for his life is artificial; his habits are disgusting and demoralizing."¹¹² The *New York Times*, which launched a campaign against spitz dogs in the mid-1870s, cited the breed's

Arctic origins as part of its supposed climatic susceptibility to rabies, as well as its low biological nature. The spitz's ignoble, degenerate ancestry, "the result of illicit relations on the part of the Esquimaux dog and the Arctic fox," contributed to its alleged hydrophobic proclivities, as well as its generally debased moral character. The malign spitz, the *Times* noted, was "irredeemably corrupt," "a tireless and shameless thief," and "completely devoid of affection."¹¹³

The growing popularity in the second half of the nineteenth century of dog-breeding as an alluring feature of pet ownership for well-off urbanites also supported the era's racial perceptions. Harriet Ritvo's pioneering study, *The Animal Estate*, demonstrated the extent to which concerns with good breeding and proper maintenance of hierarchies through social registers crossed the canine and human worlds as part of the craze for purebred dogs in Britain during the second half of the nineteenth century. In a new age of vast wealth among New York's upper crust, in which elites might pay thousands of dollars for the right purebred dog, the association of bloodlines with moral rectitude also became commonplace.¹¹⁴ As the *Tribune* observed approvingly in May 1878, in a commentary about dog shows, "Within a very few years there has been a remarkable improvement in the character of the dogs that are owned by our better classes. . . . As to hydrophobia, every owner of a valuable dog will give the assurance that the malady has never been known in respectable canine families; and the 'bench show' will be of service if it helps to demonstrate that decent dogs should not be given a bad name."¹¹⁵

Medical experts similarly invoked the era's scientific racism to show how bad breeding increased dogs' susceptibility to rabies. In 1877, the eminent New York neurologist William A. Hammond took up arguments against the spitz and warned about the dangers of racial mixing, whether in dogs or in humans. "The Spitz is a cross between the Pomeranian hound and the Arctic fox," he told a reporter from the *Herald*. He added, "All hybrids are bad. The mulatto is neither as good as the white man nor as the negro."¹¹⁶ Physician L. L. Dorr, writing in the *New York Medical Journal* in 1881, outlined the degeneration that came of racial mixing, whether in humans or in animals. In humans, he argued that "the crossing of different races only produces inferiors, natural criminals, and idiots." Crossbreeding in animals, Dorr alleged, led to similarly appalling forms of hereditarian unraveling. Dorr speculated that rabies originated from "the violation of this seeming law of Nature," namely, a natural order that supposedly kept breeds "pure and of the original race."¹¹⁷

According to the dictates of late nineteenth-century racial science, both natural and social order required the strict policing of racial bloodlines, whether in animals or humans.

The immigration-induced anxieties of the late nineteenth century also incorporated images of threatening foreigners and racial retrogression into the fretful rhetoric about rabid dogs, as part of the nativist response to the massive wave of southern and eastern European arrivals who dominated the “new immigration” of the turn of the century.¹¹⁸ The anti-spitz campaign contained nativist overtones in the contrast that the *Times* drew between the ill-bred spitz and those dogs “worthy to be the attendants or rather the friends of gentlemen,” the *Tribune*’s observation that spitzes “have been degraded from the position of distinguished foreigner to that of foreign vagabond,” and the *Eagle*’s remarks on the popularity of spitzes in “Dutchtown,” Brooklyn’s heavily German immigrant neighborhood.¹¹⁹ In 1891, the *Tribune* pitted the foreign against the native-born directly as it brooded over the dog problem. “The mad dog,” the *Tribune* contended, “nearly always seems to be a stranger, a sort of a spectral, unknown dog, which creeps into town unobserved and suddenly goes stark mad, bites the native dogs, and hurries away on his work of destruction to his next appointment.”¹²⁰ In a jarring and threatening urban world, the stray dog constituted yet another malevolent outsider, an invasive foreign menace beyond the boundaries of civic inclusion.

Yet for every commentator who associated rabid dogs with racial degeneration and the decline of civilization, another blamed civilization itself for the ills of American society, including the excessive cultural refinements that suppressed owned dogs’ natural instincts and rendered coddled pets vulnerable to rabies. Theodore Roosevelt’s notorious 1899 address on “The Strenuous Life” famously called upon Americans to reject overcivilization and “swollen, slothful ease,” and instead embrace the martial exploits necessary to build both healthy bodies and a virile nation.¹²¹ Critics of licentious pet-hood in the last third of the nineteenth century similarly targeted the overcivilization of spoiled and cosseted dogs, and not the hardened curs on the streets, as a source of degeneration and disease. As the *Brooklyn Daily Eagle* contended in 1869, “The ownerless, half-starved street curs which . . . give a dog a bad name are really less dangerous than the well fed pets of our households. . . . Well fed dogs are the readiest to bite. The most dangerous class of dogs kept are the little pets of the ladies, the shivering, snarling little poodles, attenuated grayhounds [*sic*], and terriers.”¹²² This gendered language, which

associated pampered and unhealthy pet-keeping with women in the fashionable elite, added to the impression of feminized luxury and its threat to nerve fiber in subsequent decades.¹²³ Other commentaries in the 1870s and 1880s also continued to debate the question of city dogs' debilitating confinement as a source of rabies and other diseases.¹²⁴ The wild excesses of Gilded Age high society, such as the elaborate tea parties that Mrs. Stuyvesant Fish staged for her friends' dogs, upheld notions that canine ill health had more to do with the moral corruption of wealth than the pitiful and savage condition of dogs on the street.¹²⁵

The popularization of neurasthenia added to the elaborate discourse about urban life, canine nervousness, and hydrophobia. Neurasthenia moved rapidly from medical to popular consciousness to become by the 1890s the defining disease of modernity, as a nervous condition born of overwork, high pressure, and the ceaseless demands of industrial life, in an epidemic of urban nervousness that overtook humans and animals alike.¹²⁶ The noisy, chaotic rhythms of city life, according to the *Eagle* in March 1897, made animals "fretful and nervous," and therefore "more liable to do an injury to their owners and others," in contrast to "the brutes that live a normal life in the country."¹²⁷ Sedentary urban lives also weakened dogs' character and vigor. *Our Animal Friends*, the ASPCA's main publication, relayed to its readers the *London Daily News*' reflections on "how man has demoralized the dog": "We have taught the dog to be bored. We have corrupted him so much by our society that he can no longer depend on himself, or even on other dogs, for entertainment."¹²⁸ In November 1897, *OAF* invoked the recent findings of a French physician to argue that dogs suffered from exactly the same nervous illnesses as humans, precisely because they suffered from the same "nervous atmosphere of human society. . . . In short, many dogs at the present time are affected with neurasthenia."¹²⁹ In the early twentieth century, children's author Mary Schell Hoke Bacon, who wrote under the pseudonym Dolores Bacon, also highlighted the poor health of the owned canine elite in a cultural context that associated enervation with dissolute ease. As she noted, "The rich man's dog is seldom well and the poor man's dog seems unable to become ill if he wants to."¹³⁰

Not surprisingly, New Yorkers wondered whether the neurasthenic dogs of the 1890s and 1900s might be more susceptible to rabies than the hardy strays that roamed city streets. "Lack of temperate living," according to writer and animal lover Dinah Sharpe in 1891, along with poor access to water, con-

tributed to canine madness.¹³¹ In a turn-of-the-century context in which even cancer seemed like a disease of civilization because of how modernity ravaged the mind and body (and not because of longer life spans, as present-day thinking would have it), dogs and rabies lent themselves easily to anxiety-ridden discourses about urban life and nervous disease.¹³²



Mad dog scares draw attention to the world of shared urban space between humans and domesticated animals. The same creatures whom people depended on for food, clothing, labor, and companionship possessed impressive capacities for disrupting everyday life and spreading deadly diseases. But one should remember that urban humans also excelled at generating upheaval and transmitting dangerous infections in their own intraspecies interactions. The chaotic woes and delights of human-animal relations draw our attention to the mundane, tacitly accepted conundrum of society itself, namely the uneasy dance between accommodation and conflict, order and bedlam, that is part and parcel of humans' struggle to live with one another. The free-for-all of street life in the nineteenth- and early twentieth-century city could be invigorating, exciting, perplexing, obnoxious, or repugnant, depending on general personal inclinations, one's social position, or an individual's mood of the moment; multiple contradictory impulses might also define a single person's impressions at any one time.

Meanwhile, the specter of dogs and disease on New York's streets gave direct expression to civilizational fears in the last third of the nineteenth century. Dogs and their ubiquitous presence contributed in clear and visible ways to the disorderly character of city life, which easily merged with anxiety-ridden discourses about urban insalubrity, racial degeneration, the crude state of the urban public sphere, and the undeveloped status of an allegedly advanced society. But civilization itself was also an unruly and protean concept that came to symbolize simultaneously both achievement and its undoing. The threat of overcivilization meant that the cloistered, pampered, and enervated dogs owned by well-off city residents who themselves likely lacked in bodily vigor might actually be an even greater source of dread disease than the ill-bred curs that stalked passersby. The trope of civilization gave Americans means for understanding why they felt so uneasy, nervous, and helpless in an age of progress and power, in which something as commonplace as the urban dog provided occasion to brood over the intractable predicaments of modern life.

Amid diversity of perception, experience, and apocalyptic imagination

stood some harsh biological facts. New Yorkers interacted differently with dogs, depending on social factors such as age, gender, and class status. Such circumstances shaped their vulnerability to dog bites, as well as their health practices in response. If symptomatic rabies set in, however, certain death awaited for all.

Human and Non-Human Suffering

From Animal Possession to the Art of Dying

American city dwellers in the nineteenth century knew well the ravages of disease and death at an early age. Although sanitation, germ theory, and newly invigorated public health measures began to make dramatic inroads against infectious disease starting in the 1880s, childhood mortality rates so severe that they lowered overall average life expectancies into the forties still characterized American life all the way until the end of the century. On the whole, Americans who survived childhood could expect much longer life spans, into their sixties on average. Significantly bleaker conditions prevailed in cities, however, where crowded conditions, lax sanitary standards, and dangerous vulnerability to epidemics and contagion produced appallingly high mortality. In New York City in 1857, the Association for the Improvement of the Condition of the Poor estimated a death rate of one in twenty-seven. That grim figure far outpaced Boston, Philadelphia, Paris, London, and Liverpool; furthermore, New York's annual death rate even surpassed the birth rate during parts of the 1850s. In addition to infant mortality rates in New York City that surpassed one in five in 1870, young adulthood also carried high risks. Available statistics suggest that of adults who reached the age of 20 in the years 1840 and 1870, nearly one-quarter died within a decade. Such stark realities led the *New York Herald* in 1881 to label New York "the most unhealthy city in the Union." With improved sanitation, overall mortality in New York fell to one in forty-four in the 1890s, and it continued to decline in subsequent decades. Even so, sorrowful encounters with early death remained a common and expected part of everyday life for individuals within their local circles of family, friends, and community well into the twentieth century.¹

Among such forbidding statistics, hydrophobia deaths barely registered. Nonetheless, rabies, with its origins in the bite of an ordinarily mundane

companion animal turned suddenly deadly and its promise of excruciating suffering that beggared the imagination, formed the stuff of cultural nightmares. For a New York penny press eager to fill its pages with dramatic stories that would thrill, shock, and horrify, a disease that was out of the ordinary, spectacularly cruel, and particularly dreaded always made good news copy.

News accounts thus provide resources for exploring the diverse cultural meanings that Americans attached to the process of sickening and dying from hydrophobia during the second half of the nineteenth century. Portrayals of rabies' physical toll on victims, both human and animal, testify to the experiential nature of suffering peculiar to the disease, as well as the cultural dimensions of human-animal relationships. Metaphorical constructions of hydrophobia as a form of animal possession and debates over the morality of mercy killing convey a broader sense of the multiple considerations and beliefs that Americans brought to interspecies encounters and to the ethics of ending life. Hydrophobia narratives also paid close attention to dying patients' last moments, in a refrain that reflected readers' and authors' unstated but shared commitment to knowing whether the unfortunate victim had at least obtained final release through the nineteenth-century ideal of "the Good Death."

Not every incident discussed in this chapter would count as a "real" rabies case today. Reports of long incubation periods, symptoms that appeared several weeks before diagnosis, and instances of recovery provide cause for twenty-first-century skepticism, and they frequently raised doubts in the nineteenth century as well. Where necessary, I point out the inconsistencies, but the more important issue concerns how Americans in the past thought and spoke about hydrophobia, and not the accuracy of their understanding by present-day standards. In focusing on the entire second half of the nineteenth century, my account of suffering and dying also quietly crosses the chronological divide established by Louis Pasteur's development of preventive rabies vaccination in 1885. Pasteur's discovery undoubtedly changed the fates of thousands of potential rabies victims in the final years of the nineteenth century, but it made no difference to those who developed symptoms. For them, their experience with the disease remained much as it had always been—dreadful, agonizing, and gruesome.

Hydrophobia in the News: Discourses of Human Suffering

News stories about hydrophobia cases showcase not just how people died, but how nineteenth-century observers talked about rabies deaths, and how

New York dailies presented a wider world to their local readership. As noted in the previous chapter, news circulated rapidly in the United States even before telegraphy. In the early nineteenth century, a single person frequently combined the roles of publisher, editor, and reporter, and larger newspaper staffs as late as the 1840s consisted of just four or five people including the printers. Consequently, daily papers, particularly the penny press, relied heavily on stories culled from the news outlets of other cities and towns to fill their pages with fresh human interest stories. Between the penny press, more restrained dailies, and the respectably staid commercial press, New York City already possessed a highly active and competitive news culture by the 1830s. The expansion of the ethnic press further enriched the city's informational environment over the next several decades. As a result, New Yorkers did not simply live and think locally. News tied urban residents to the nation as a whole, and reports of rabies cases from the city's hinterland, as well as across the country and around the world, helped to shape their real and imagined encounters with the disease. To the extent that local daily papers reflected a New York state of mind, they made distant events a part of the life of the city, and they created virtual spaces where New Yorkers grappled with hydrophobia and its implications.²

The vast majority of hydrophobia stories in New York's major dailies did not exceed a paragraph or two, but these compact synopses conveyed powerful narratives of human lives that ended in excruciating suffering. The briefest stories contained little more than the bare fact of cause of death. "A woman yesterday died of hydrophobia at Camden, N.J. She was bitten on July 4." "A child in Harrison, N.J., who was bitten by a mad dog, died of hydrophobia."³ More typical accounts included particulars about the victim—his or her gender, age, occupation, perhaps some small personal characteristics—as well as a description of the course of the disease. A few spare details about the death of an "interesting" child or a man "60 years old, unmarried and wealthy," let readers know something of the extent of human loss that had taken place.⁴ When John H. Cooper of White Plains, New York, died from hydrophobia in June 1895, readers learned, in addition to the medical particulars of the case, that Cooper managed the finances of a local farm, and that "he was one of the most popular young men in town, was highly connected and prominent in amateur theatrical and singing circles."⁵

Rabies, as befitted its reputation, left behind harrowing images of horror, in which hours or days of prolonged misery and agony marked hydrophobia's grisly torments. Rare was a victim such as George W. Powell, who "died

easily” in Philadelphia in October 1879, or Edward Moore of Trenton, New Jersey, who “had very few paroxysms and no violent convulsions,” and who simply “slept quietly” before he drifted away in February 1882.⁶ More commonly, newspapers relayed fearsome summaries of protracted ordeals, as in the 1848 case of young John Craymer of Philadelphia, just “a lad,” who passed away from hydrophobia “after suffering the most intense torments,” or the unnamed 10-year-old girl near Buffalo a decade later who endured “the most excruciating torture” before succumbing. When a ship’s captain reported a shipboard death from hydrophobia in 1881, he evocatively described the dreadful symptoms that he witnessed and declared, “The concentrated agony of a hundred ordinary deathbeds would not equal the sum of that boy’s suffering.”⁷

Where brief reports could only hint at the physical horrors of rabies, medical case histories and treatises, along with more extensive news stories, documented at length the symptoms of hydrophobia. Case narratives typically began with a sense of unexplained anxiety, irritation, and restlessness in the ailing person. As the course of the disease progressed, patients experienced powerful and uncontrollable paroxysms that wracked their bodies. Sleeplessness, agitation, elevated pulse rates and ragged breathing, inability to swallow food or liquids without triggering fierce spasmodic attacks, and hypersensitivity to stimuli such as light, air currents, the smell of ether or chloroform, or even the presence of a stranger, all of which might also throw a stricken body into the most frightful convulsions, also frequently characterized the deteriorating condition of the afflicted. Efforts to calm spasms or sedate with ether, chloroform, opiates, or, in the latter part of the nineteenth century, curare, often failed, leaving physicians helpless to alleviate suffering. Sometimes patients died quietly, seemingly in a state of exhaustion, while other times they expired during one final, fatal episode of paroxysm.⁸ In 1880, physician James Collins vividly described to the Philadelphia County Medical Society the punishing last moments of one woman’s life: “At 5.25 A.M. her limbs suddenly straightened; her face became horribly convulsed; her hands became clenched and rigid; her body was spasmodically bent backwards. This condition of violent tonic spasm continued for five minutes, when she relaxed—dead.”⁹

Newspaper accounts frequently acknowledged that in the face of such incurable torment, death provided a welcome release.¹⁰ Harrowing deathbed scenes out of proportion with all prior experience left a profound impression on physicians and lay witnesses alike. When the *Brooklyn Daily Eagle* described the suffering of a 5-year-old boy at a Sag Harbor convent in 1883, for

example, the report vividly described a doctor's inability to find adequate words for the child's extreme convulsions and other symptoms: "It would be impossible to describe their intensity. He never witnessed anything so dreadful in the whole course of his life in the hospitals anywhere else." The medical personnel who looked after New Jersey farmhand George Kendall at the Chambers Street Hospital in Lower Manhattan in January 1891 also found the brutality of the disease beyond their ken. As the *New York Tribune* observed, "Even the doctors, who are generally used to suffering of all character, had to turn away from the sight of the poor fellow's sufferings." Indeed, the symptoms of hydrophobia were so extreme that toward the end of the nineteenth century, the New York State Board of Health classified rabies deaths as violent deaths, a category that also included death by drowning, railway accident, and suicide.¹¹

Like death itself, rabies was a great equalizer, and it did not distinguish between its victims. As discussed in the previous chapter, the likelihood of incurring dog bites and contracting rabies did vary by gender and age. Race, ethnicity, and class also likely affected rates of dog bites and hydrophobia in ways that remained hidden in plain sight to nineteenth-century observers. For example, whether children played in urban streets or had their own yards where they were less vulnerable to stray dogs, or whether they taunted and chased dogs or obeyed parental injunctions to be kind to animals, involved social circumstances and status. After 1885, access to vaccination under Pasteur's regimen also likely varied with racial, ethnic, and class background. Class and other markers of identity shaped the rhythms and rituals of death as well. On Long Island in 1889, Frank Miller, the 11-year-old son of a cigar maker, developed hydrophobia from a dog bite and "died in the arms of a neighbor." Even this spare account contains hints of how working-class life shaped the boy's last moments. He passed away on a Friday morning, and his father almost certainly had to work. The newspaper story left Frank's mother unmentioned, but if she was alive and with the family, she may well have also held a job outside the home in order to maintain the family's income. Thus the boy died under a neighbor's care, and not in the presence of his parents.¹²

But once symptoms actually manifested themselves, rabies respected none of the human categories of social stratification. The agony of William Brown, described only as "a colored boy" who died in Pentonville, New Jersey, "after suffering terribly from hydrophobia for five days, differed little from that of John Hopper, "one of the wealthiest and best known citizens of Bergen County," who sickened with hydrophobia and endured convulsions that "be-

came more frequent until death brought relief.”¹³ Although gender, age, class, and ethno-racial identity had some bearing on who developed rabies, after that, the disease dispensed suffering indiscriminately, as it followed its invariably fatal course.¹⁴

Animal Victims: Value, Spectacle, and Sentiment

Animals’ deaths from rabies also attracted public notice, and stories in newspapers reflected the distinctive cultural meanings Americans attached to animal suffering. Humans and animals shared both rural and urban ecosystems, and mad dogs on the loose differentiated little among species. The dogs themselves might be considered the foremost victims, although newspapers’ narrative conventions drew distinctions between the rabid perpetrators that spread the disease and their guiltless, hydrophobic targets, both human and animal. Rabid dogs savaged dogs, cats, horses, cows, sheep, and other animals who happened to cross their paths, and domestic animals that contracted disease from dog bites attracted considerable public attention. As noted in the introduction, although physicians throughout most of the nineteenth century tended to reserve the term “hydrophobia” primarily for humans, the distinction was far from absolute, and both medical texts and popular sources described animals as stricken with hydrophobia following mad dog attacks.¹⁵ Domesticated animals’ deaths from rabies represented economic losses, as well as threats to human health. The bite of a roaming mad dog might link human and animal fates, either because people suffered wounds from the same dogs that bit their animals, or because their own potentially infected animals might become sources of disease and death. Human attraction to the bizarre and grotesque highlighted the spectacle of animal suffering. But human perception did not stay confined within the realm of the alien observer, who sought the sensation of horrified fascination more than the bond of empathy. Ties of sympathy and affection also joined humans and their animals, and particularly in the case of horses, people could feel keenly the harsh loss of a beast who had provided both a livelihood and companionship.

As discussed earlier, a rabid dog in either the city or countryside might encounter dozens of animals in its frenzied wanderings before dying either from the disease or by a human hand. Economic losses could be considerable, particularly in cases where multiple animals contracted rabies from a single dog’s frenzied attacks. Nineteenth-century observers rarely commented on the economic hardship suffered by families that lost the labor of a loved one, but their familiarity with animals as a form of property meant no such reti-

cence in the case of non-human rabies victims. Americans' everyday language distinguished between "valuable" and "worthless" animals, between those animals that performed useful labor, provided sources of food and raw materials, or constituted valuable commodities by virtue of good breeding and those that offered no such qualities. "Ten sheep have died of hydrophobia in Brecksville, Ohio, from the bites of a worthless cur," commented one report in February 1879, in phrasing that underscored the unstated value of the sheep by emphasizing the worthlessness of the dog whose bite killed them. "The cow killed was a valuable Alderney" read another account from Cliffwood, New Jersey, in 1886. In that case, the cow's owner feared additional losses, for the mad cow had bitten other cows and horses before being "shot to stop its ravages." A decade later, when rabies broke out in two separate herds in Hudson, New York, and multiple cows died, the New York State Department of Agriculture's attention to the case signified the economic interests at stake. Such was the "great annoyance and loss of stock" that could result "from the acts of a mad dog."¹⁶ These and other countless reports in New York newspapers testified to the losses of valuable property that came when sheep, cattle, and other livestock contracted rabies.

The deaths of horses could also be costly, since so many Americans relied on their labor for their livelihoods. By the mid-nineteenth century, draft horses of the most prestigious breeds could command up to \$1,000, with the best stud horses selling for ten times as much. Admittedly, most urban workhorses were worth less than \$100, but even so, as Clay McShane and Joel A. Tarr have concluded, horses constituted "a major capital investment." The dramatic expansion of organized thoroughbred racing and harness racing in the second half of the nineteenth century also made deaths of expensive racehorses a subject worthy of public notice.¹⁷ The loss on Long Island of "the valuable Trotting Stallion Enterprise" to rabies in May 1862, for example, provided occasion for a lavish description of the horse's suffering, as well as a commentary on the economic hardship that came with the death of an animal "valued . . . at about \$1,500."¹⁸ That financial blow paled compared to the staggering figure associated with the death of Ripon Boy a decade later. When "the celebrated trotter" expired a month after suffering a bite from a mad dog, a brief obituary noted that "his owner had refused \$25,000 for him," a testimony to his monetary value as well as to his owner's attachment to a special and noble creature.¹⁹

Dogs of recognized breeding also possessed monetary value, and newspapers paid extra attention to their demise. "Valuable Dogs Killed," reported

the *New York Times* in June 1885, after a New Jersey kennel owner was forced to put down nearly all of his canine boarders, “none of whom could have been bought for less than \$150,” after random attacks by two mad dogs on the loose.²⁰ The deaths of higher-priced dogs provided glimpses into the leisure and lifestyles of the nation’s wealthiest citizens. By the late nineteenth century, American elites’ enthusiasm for Darwinian social thought as a means of validating their own fitness to rule facilitated the spread from England to the United States of the vogue in purebred dogs as a marker of conspicuous consumption. Wealthy dog fanciers eagerly paid up to \$5,000 to secure animals that befit their social stature.²¹ The death of “His Nibs,” New York banking magnate J. P. Morgan’s \$3,000, prize-winning bull terrier, reportedly from rabies contracted following a fight with a Maltese cat, alerted newspaper readers to the canine dimensions of urban, Gilded Age decadence.²²

Americans in the nineteenth century were accustomed to gauging their animals by monetary value, but their interest in non-human rabies deaths went beyond mere lucre or curiosity about the lives of the well-to-do. Stories in New York newspapers in which marauding dogs led to the deaths of both people and their livestock alerted readers to the frightful possibilities that lay in their interactions with domestic animals. In February 1853, the death of W. C. Hendrickson of Barrington, Illinois, provided just one such example of animals’ and humans’ potential shared fates. Hendrickson died “in great agony” along with several of his cattle two weeks earlier; all had been bitten by the same rabid dog. Decades later, near Plainfield, New Jersey, “a vagrant cur, giving every symptom of rabies, ran through the village, biting everything that came in its way. Among its victims were a score or more of cows, two horses, several dogs, and three children.” After four weeks, the cows began to show symptoms, and ten soon died, leaving the children’s parents “in a very apprehensive state of mind.” A chain of infection could also connect mad dogs on the rampage, livestock animals, and humans. In one such case in Kansas City, for example, a rabid dog bit a steer, who consequently went on to infect the rest of the herd. The three brothers who owned the cattle “did not know the terrible nature of the disease with which their cattle were infected,” and they, too, developed hydrophobia from bites incurred while handling their stock.²³ Although the newspaper story adopted a matter-of-fact, non-censorious tone, the lesson seemed clear: ignorance could be deadly, and people needed to exercise appropriate vigilance in their handling of animals.

Animals’ death struggles were also newsworthy because they contained the allure of spectacle. A voyeuristic interest in the bizarre and grotesque pro-

duced a fascination with the violence that rabid animals, especially horses, did to themselves. The self-mutilation of a horse in Milford, Pennsylvania, in 1843 compelled one witness to describe the macabre scene to his local newspaper: "It sickened me to see the fine, noble animal eating his own flesh!" Over the years, other accounts vividly described similarly terrible sights, whether in the greater New York City area or elsewhere in the United States, in which horses afflicted with hydrophobia gnawed their own legs down to their bones.²⁴ In addition to appearing in the daily papers, rabid animals sometimes became public attractions as well. In July 1865, the *Lafayette Courier*, an Indiana paper, relayed the story of a horse at a lumber mill who developed hydrophobia, and whose symptoms included foaming at the mouth and attempts to bite nearby objects and animals. "Hundreds of citizens," the paper reported, "have flocked to Mr. Parker's stable to see the animal." In 1876, locals in Fitchburg, Massachusetts, gathered to witness the drama of a horse dying from rabies, although they "were compelled to withdraw, as it was so terrible to look upon." In other cases, tougher crowds watched until the bitter end. Decades later, sturdier, more determined groups of up to a hundred people gathered daily at the barns of John R. Rockefeller's dairy in Chester, New Jersey, to watch as his Holstein cows died from hydrophobia.²⁵

At the same time, one should not overstate the lurid aspects of nineteenth-century Americans' interest in the suffering of hydrophobic animals as distinct from attitudes toward human victims. In a nineteenth-century era that melded the grotesque with popular entertainment, large groups sometimes descended on the homes of dying human patients, as in the house "besieged with hundreds of curiosity seekers" in rural New Jersey in 1880, the "crowds of people congregated" near the home of a rabies victim in Reading, Pennsylvania, in 1882, or the "crowds of curious people" that gathered as Newark pound-keeper George Neall struggled for his life in 1886.²⁶ Moreover, feelings of admiration and bonds of sentiment also tied people to their animals, especially horses, whose critical physical labor on city streets and in agricultural settings earned them a special place in human hearts. Not coincidentally, the ASPCA, upon its founding in 1866, made protections for working horses its top priority. Animal welfare advocates insisted that such admirable beasts, who contributed so generously to human welfare with their labor, deserved consideration from the law. Legislators agreed, and in the late nineteenth and early twentieth centuries, horses benefited most from New York's anti-cruelty statutes.²⁷

In this context, when an Eighth Avenue butcher named Metzger lost his

horse to rabies, the *New York Tribune* depicted the death in sentimental terms of affection, friendship, and loyalty between species. The paper noted that the horse was a local favorite. "He was a good butcher's horse," the paper reported, "and the children in the neighborhood used to pet him and bring him all sorts of dainties that horses are fond of." In early December 1885, when a mad dog came with its threatening demeanor, Metzger's horse faithfully stood his ground, for "he couldn't forget the duty that all butchers' horses owe to their masters of not moving until they are told to." The poor horse "stood shivering in his shoes" when the dog attacked and viciously bit into his forelegs, and Metzger emerged from his shop too late to help.

The horse continued to work while under veterinary care, but after three weeks, he began to behave in a strange manner. Metzger, "a kind-hearted man," decided to give his horse a break from work, but when the animal became restless and agitated, the veterinarian "pronounced it a case of hydrophobia." The horse's suffering grew more and more extreme, "but Mr. Metzger was so much attached to the horse that he could not bear to have him die." Finally, when Metzger was able to concede the hopelessness of the horse's condition, he called in an officer from the ASPCA, who put the animal out of his misery with a bullet to the head.²⁸

Such stories tell us that rabid animals signified far more than simply monetary loss or an opportunity to indulge in the frisson of an encounter with a notoriously dramatic and deadly disease. Metzger's horse, at least according to the *Tribune's* reckoning, was a loyal companion and a beloved fixture in the neighborhood. Although from a contemporary perspective one might fault Metzger for working his horse while injured and for not putting him down soon enough, his actions, which emanated from kindness and consideration, measured up to nineteenth-century standards of Victorian sentiment. Even if Metzger failed his horse in the animal's final hours, the lapse originated from love and not malice, and twenty-first-century readers should have no difficulty recognizing the painful nature of Metzger's decision for both beast and human.

Beliefs Left Unsaid: Rabies, Animal Possession, and the Lurking Werewolf

Beyond fears of infection, measures of economic loss, and feelings of empathy and sentiment, tacit assumptions about spiritual or otherwise mystical connections between humans and animals shaped American responses to hydrophobia. Histories of rabies have frequently commented on the discourses

of animality, fears of monsters, and tropes of demonic possession associated with the disease in different parts of the world from antiquity to the nineteenth century.²⁹ The United States was no different. Commonplace observations that human rabies victims barked like dogs or adopted other characteristics of the animal that bit them, or that hydrophobia could be prevented by chopping off the tail of the dog who delivered the bite, signified more than simply fanciful description or amusing folk superstition. Rather, they implied a world of beliefs that the European-descended Americans of the time may not have themselves known they held, in which descriptions of rabies symptoms reflected a cosmology open to the possibility of immaterial and supernatural ties between humans and animals.

Reaching such conclusions necessitates some willingness to embrace speculation and read between the lines of reticent sources. Most nineteenth-century European Americans and, until the mid-twentieth century, their academic descendants disdained religious beliefs that rested on human engagement with animal spirits, and in their quickness to distinguish the cultural inferiority of “primitive” peoples from their own “civilized” status, they disavowed such structures of belief among themselves. The stance of cultural supremacy masked the lore and rich heritage of folklore and superstition that pervaded Euro-American cultures throughout the nineteenth century and on into the present day.³⁰

Consequently, in order to recover unspoken fears about animal possession in the United States during the nineteenth century, one must, as Carlo Ginzburg emphasized in his study of witchcraft in sixteenth- and seventeenth-century Europe, look for the deeper cultural meanings that reside in “the anomalies, the cracks” within documentary accounts.³¹ “Ancient myths,” according to Ginzburg, remained alive in early modern Europe and indeed “are still active,” since “the unfathomable experience that humanity has symbolically expressed for millennia through myths, fables, rituals and ecstasies, remains one of the hidden centres of our culture, of the way we exist in this world.”³² Although rabies narratives from nineteenth-century American newspapers might lack some of the grandeur of “myths, fables, rituals and ecstasies,” they nonetheless provide access to an otherwise unacknowledged realm of European American engagement with unseen forces that bound humans and animals.

Accounts of human rabies victims often described them as snapping and barking like dogs or otherwise displaying canine attributes. An 1861 report from the *Boston Traveller*, reprinted by the *New York Tribune*, was typical:

"This disease, it is well known, induces the patient to bite like a dog."³³ Similar observations figured in reports in New York City and the surrounding area over the decades, as in the case of 7-year-old William McGuinnis, whose symptoms included "snapping his teeth and moaning like a dog" before he finally died on the Lower East Side in July 1874, or more than two decades later, 5-year-old Albert Benz, who "flung himself out of his cot to the floor, crawled along on his knees and snarled like an angry dog" as he suffered hydrophobia-induced convulsions at St. Catherine's Hospital in Brooklyn.³⁴ Even a rabid horse might start "emitting sounds very much resembling the bark of a dog" or "snapping and growling like a dog."³⁵

Physicians frequently emphasized that "barking" sounds merely resulted from patients' strenuous efforts to clear mucus from their throats or other physical impediments during spasms. In case histories from the 1850s and 1860s, doctors sometimes conceded the uncanny resemblance of patients' utterances to canine sounds, but they also warned readers not to draw inferences. As one physician observed in 1854, "There seemed to be almost a pause between every two words, giving such a peculiarity to his speaking that I could readily understand the origin of the popular notion, that patients with hydrophobia sometimes bark like a dog. This peculiar mode of utterance is no doubt owing to the extreme rapidity with which the patients breathe."³⁶ At most, a mid-nineteenth-century physician's fancy extended to noting "a wild, unnatural expression of her eye" in an unfortunate hydrophobia sufferer, but for the most part, medical reporting tried to restrict itself to factual recitation, without metaphorical adornment, and to relegate descriptions of canine symptoms to the realm of popular belief.³⁷

By the late 1880s, in a context of germ theory's growing cultural authority and increased confidence about scientific command over rabies after the development of Pasteurian rabies vaccination, physicians began taking a harder line against canine metaphors. In early 1886, for example, members of the Clinical Society of the New York Post-Graduate Medical School discussed the etiology of hydrophobia at length. D. B. St. John Roosa launched the deliberations by emphasizing the need for the medical community to arrive at a clear scientific understanding of the disease, and a succession of speakers stressed that "the real symptoms do not consist in barking like a dog or refusing to drink water."³⁸ The following year, "A Physician" slammed the newspapers for their credulous reports about what he (or, far less likely, she) considered to be a sham case of hydrophobia. The writer noted, "Barking, snarling and biting are not necessary symptoms attending the disease in man. There

is an attempt to clear the throat of a thick, tenacious mucous which is choking the patient, and often produces a sound which is imagined by some to resemble the hoarse bark of a dog, but is not a typical dog's bark."³⁹ In the fall of 1889, following the hydrophobia death of William H. Hoagland of Newark, New Jersey, the attending physician reportedly "said that persons who die from hydrophobia do not imitate a dog in any way. It is ignorant people who think that they do because they make a noise in trying to get air when they are choking, and cannot quench the burning fever in the throat with water."⁴⁰ In an era of rising expectations about the power of modern medicine, proper medical discussion permitted no hint of hydrophobia victims barking, snarling, or otherwise acting like dogs.

Newspaper stories also began to display more caution in terminology. For example, in the case of a human rabies victim in November 1887, rather than describing the patient as directly exhibiting canine characteristics, the *New York Tribune* observed that the victim had developed "the sharp, dry cough which *simulates* [emphasis added] the bark of a dog." Similarly, when George Kendall died of hydrophobia in January 1891, the *Tribune* carefully noted that "the rasping sound" that accompanied his convulsions "was thought by some to resemble the barking of a dog," when previously the paper might have simply said that he barked like a dog.⁴¹

Habits died hard, however, and the old conventions of reporting symptoms persisted alongside the new. In August 1891, the *Tribune* monitored the condition of 17-year-old Hugo Eitel, a known epileptic who had suffered a dog bite four weeks earlier. Eitel developed a severe case of what doctors initially feared was hydrophobia, although his apparent recovery ultimately suggested he had had an epileptic fit. But the *Tribune* reported his case as a hydrophobia story, and it invoked a familiar set of canine metaphors. During convulsions, his fingers "were half closed, resembling an animal's claws," and he emitted "horrible cries—a cross between the howl of a wolf and the laugh of a hyena." Other accounts from the 1890s, such as the description of 19-year-old hydrophobia victim Lizzie Byram's labored efforts at speech, in which "the sound emitted was more like that of a subdued growl from a whining dog rather than that of a human being," also spoke to the continued association of rabies with canine animality.⁴²

Beneath the surface of what might at first seem like colorful but nonetheless sincere attempts at faithful description, in which people barked and snapped, lay unspoken theories about human connections with animals that went beyond the forces of nature. The tendency to ascribe to human rabies

victims the characteristics of the animal that bit them, for example, assumed unseen ties between human and animal essences that amounted to a tacit belief in animal possession. Such notions were not simply the province of an antebellum, largely rural society. They persisted all the way into the turn of the century as part of deeply embedded forms of everyday knowledge.

The report of a Dr. Wales, who attended a ship's captain near Cape May, New Jersey, in the summer of 1852, conveyed the notion of animal possession more explicitly than most accounts. Wales vividly observed, "In the flitting and varied expressions which passed over the countenance of the unfortunate patient toward the close of life, there were exhibited such appearance as would lead the beholder, (without much stretch of the imagination) to suppose, that the rabid creature, whose deadly poison was circulating through his system by its bite, had worked out the effect of transforming his very nature into its own;—there was the rabid canine expression as fully depicted as the human features would in anywise allow."⁴³ Although Wales acknowledged a certain absurdity in imagining the disease as an exertion of animal nature over human essence, he also could find no better way to describe the victim's symptoms. Nor did such impressions belong solely to an earlier, antebellum era. When Brooklyn builder Jacob Hertline succumbed to hydrophobia in 1886, the *New York Herald* included one tellingly spooky detail. Five minutes after his death, "the bluish ring on his hand—the mark of the Newfoundland's fatal bite—which had been very prominent in his death agony, disappeared." Only with the final end of life did the accursed mark of malign canine influence vanish.⁴⁴

The tendency to detect feline symptoms in sufferers of cat bites also suggests how Americans, whether consciously or unconsciously, imagined rabies as a form of animal possession. Hydrophobia victims bitten by dogs never exhibited catlike symptoms, but cat bite victims acted otherwise. Mrs. Nicholas Campbell, who resided near Paterson, New Jersey, reportedly died of hydrophobia in January 1857. Although the initial manifestation of symptoms four weeks before her death casts doubt on the diagnosis of rabies from a twenty-first-century point of view, the mid-nineteenth-century account of her case did not hesitate to attribute her death to hydrophobia contracted from a cat's bite three months earlier. In addition to her general suffering, the newspaper picked up on a telling detail of feline behavior: "During the last four weeks she has eaten but a small quantity of food, and even that was lapped up as if by a cat."⁴⁵ When Herman Schumann of Brooklyn developed hydrophobia from a cat bite in November 1873, he did not just bark and growl

in “perfect imitation” of a dog, but he also “would attempt to scratch those within his reach, his fingers being set as a cat’s claw,” and “he spits like a cat occasionally.”⁴⁶ More than thirty years later, 8-year-old Frieda Waldau of Glen Island, on the Long Island Sound, developed hydrophobia after suffering a bite from her pet cat. She endured the wracking convulsions typical of the disease, and then, according to the *New York Tribune*, “Just before she died she made a noise like a mad cat.”⁴⁷

Other biting animals also seemed to lend their behavioral characteristics to their victims. In 1886, the *Brooklyn Daily Eagle* reprinted accounts from Kansas City about the symptoms of two people ultimately cured by application of the madstone. The one who had been bitten by a horse “would spring suddenly to his feet and run wildly about the room after the manner of a pacing horse,” while in another case, a boy bitten by a mad hog “would get down on his hands and knees and exhibit the traits of the animal which bit him.”⁴⁸ For skeptical readers, of course, the reported cure implied that neither person had rabies in the first place, which suggested the fantastical language at work, yet also made the metaphorical transfer of animality that much more telling. Even as late as 1912, the idea persisted of the biting animal’s imprint of its essence onto its human quarry. That year, in a case of rabies contracted from a horse bite, the *Tribune* reported without any hint of irony that the unfortunate victim “has been neighing and displaying her teeth in the same manner as a horse.”⁴⁹

News reports of patients’ symptoms often indicated that animals exerted a strong hold over victims’ imaginations as well. In Hudson, New Jersey, in 1871, Richard McNulty experienced “violent paroxysms, causing him to dash himself about the room, at the same time snapping his teeth and crying out ‘Dog!’ ‘dog!’ ‘dog!’” In the mid-1880s, a young boy from a farm family near New Brunswick, New Jersey, not only “began to froth at the mouth and bark like a dog” as hydrophobia took possession of his body, but in addition, “when able to speak the boy cried out that the room was full of dogs that were trying to tear him to pieces.” George Hallenbeck, a 33-year-old plumber, “spoke of dogs and snarled” just before he died in 1896. Edward Peterson, a 13-year-old who lay dying in the Harlem Hospital in August 1900, experienced “the usual hallucinations of hydrophobia patients, believing there was a dog trying to get at him and that persons were annoying him.”⁵⁰

The hold of the animal over the victim’s psyche could also express itself forcefully if a hydrophobia patient happened to encounter the type of animal that delivered the original bite. In April 1879, John Nee, an engineer, con-

tracted rabies two months after he paused to play with a dog at the Brooklyn lumberyard that employed him. The dog bit him on the thumb, and although he immediately had the wound cauterized, weeks later he developed the dreaded symptoms of hydrophobia. When his convulsions worsened, Nee's physicians decided to hospitalize him. They traveled by carriage to the hospital gates, where a black-and-tan dog started barking at the vehicle.⁵¹

The effect on the patient was electric. As one of the doctors treating Nee described it, "In an instant a paroxysm of mania came on, and the patient became so violent that it was with the greatest difficulty the attendants could restrain him from doing violence." The *Brooklyn Daily Eagle* reporter who covered the case chose stronger language: "As Nee's eye fell upon the animal he seemed TRANSFORMED INTO A DEMON. His eyes protruded from their sockets, his lips became livid, and his features terribly distorted." The hospital decided not to admit Nee, so he returned home to continue his ordeal. There, in response to a visiting policeman, he "snapped . . . savagely several times, exhibiting every symptom of a ra[b]id dog."⁵²

Although such depictions at one level reflected little more than narrative license and journalistic hyperbole, the choice of language and metaphor also provides a measure of the concerns and mentality of a society at a given point in time. Why describe an unfortunate sufferer as looking like a demon or acting like a rabid dog, as opposed to any other number of possible similes and metaphors that a reporter in search of flamboyant description might have employed? Symptoms provoke images of demonic transformation or animal possession only if a society, at some level, believes in such a possibility, whether as an act of imagination or a literal description of reality. In 1885, the *New York Herald* explicitly acknowledged the ties between rabies discourses and notions about animals' spiritual hold over bite victims. As the *Herald* commented, "The notion—more prevalent than is supposed—that something of the dog's nature, testified by barking, biting, &c, enters into that of a human being bitten by a mad dog really belongs to the age of witchcraft, the vampire, the were-wolf and demoniac possessions."⁵³

A society that contrasted its level of civilization with the savagery of others, and that viewed belief in animal spirits as the province of primitives and heathens, usually discouraged open expression of such beliefs. At the same time, however, the nineteenth-century enthusiasm for spiritualism, theosophy, and other related fads indicated the substantial willingness of European Americans to believe in supernatural phenomena even as they proclaimed their rejection of superstition. In this context of simultaneous denial and

belief, one can find substantial evidence of animist assumptions at work in nineteenth-century European American conceptions of rabies by reading between the lines. In addition to the foregoing discussion of canine and feline symptoms, consider the widespread belief that the dog that bit someone should be killed to prevent rabies in a person already bitten. In the summer of 1895, for example, a Brooklyn woman asked a local magistrate for an order allowing the police to kill a dog who had bitten her 5-year-old son, whom she thought was developing hydrophobia symptoms. "I believe my child will not recover until the dog is dead," she told the court. Such demands occurred regularly, although accounts of court cases or other instances in which bite victims, relatives, or neighbors called for the death of the perpetrator rarely explained the theory behind these appeals.⁵⁴ At most, as one correspondent to the *Tribune* put it, "There is . . . an idea that if the dog is killed the patient will be much safer, because of the prevailing superstition that if the dog in after years should be taken with rabies that disease will revert to him who was once bitten by the dog."⁵⁵ Enlightenment rationality or linear conceptions of causality could not explain such a remedy, which seemed, as the *Eagle* observed, "a common absurdity."⁵⁶ Rather, the practice implied silent devotion to notions of contagious magic, which assumed the persistence of the animal's invisible hold upon its human victim following the initial contact. Folk treatments involving application of the offending dog's hair to the wound, cutting off the dog's tail, or killing the dog and eating its cooked heart or liver—some of which appeared in classical sources from ancient Greece or Rome—also conjured up sympathetic magic as the answer to a mad dog's power.⁵⁷

One senses as well an undercurrent of werewolf mythology in newspaper reports that implied invisible ties between humans and animals in postulating an inexplicable hold of the rabid animal over its human victim. In 1855, the *Brooklyn Daily Eagle* relayed a particularly vivid werewolf story of sorts from rural France that involved the grisly murder of a newlywed bride by her husband, a 25-year-old farmer by the name of Peyron. The bride's parents had long opposed a betrothal "on account of the strangeness of conduct sometimes observed in the young man," although as the son of relatively prosperous farmers, he "otherwise was a most eli[g]ible match." But when "his passion for the girl became at length so violent that he declared he could not exist without her," his mother made one last appeal, and the bride's parents consented to the marriage. After the festivities, which ended at daybreak, the newlywed couple proceeded to their wedding bed. Shortly thereafter, the

groom's mother and father heard "fearful shrieks" from the newlyweds' bed-chamber, and they rushed in to find "the poor girl . . . in the agonies of death—her bosom torn open and lacerated in a most horrible manner, and the wretched husband in a fit of raving madness and covered with blood, having actually devoured a portion of the unfortunate girl's breast." The bride soon died from her injuries; her husband, after "a most violent resistance," lapsed into unconsciousness and also succumbed. The gruesome incident seemed to defy explanation, but "it was then recollected, in answer to searching questions by a physician, that somewhere about five years previously [the groom] had been bitten by a strange dog." Although no definitive evidence pointed to rabies in the dog, the transfer of madness from dog to human seemed like the only compelling explanation to the grieving parents.⁵⁸

What is a present-day reader to make of such a story? At no point did the nineteenth-century witnesses and reporters resort to supernatural explanations. They did not pin blame on spirits, demons, or werewolves. Nonetheless, the narrative, with its overtones of Gothic horror, contains the essence of a werewolf story: the toxic bite of a canine turned a man into a monster who tore his victim into pieces, his sexual instincts perverted into the most depraved carnal violence. The *Eagle's* account did not challenge the explanation of a dog bite as the ultimate cause of the murder—it accepted the report as "a sad and distressing case of hydrophobia." Moreover, versions of this killer groom incident had been in circulation since at least the beginning of the eighteenth century. In relaying the latest rendition, the *Eagle* was spreading not the news, but a hydrophobic folktale about mad dogs, animality, and the ease of slippage between man and beast.⁵⁹

A full analysis of the origins of nineteenth-century American notions about rabies as a form of animal possession lies beyond the scope of this study, but some speculation is possible. Societies ranging across vast expanses of space and time have included were-animals and animal spirits in their belief systems, and scholars of folklore have debated vigorously over whether the similarities in so many mythic traditions found across the globe reflect innate human patterns of thought and perception or historical processes that dispersed variants of stories from common points of origin.⁶⁰ In the case of nineteenth-century America, one can easily argue for the historical lineage of beliefs about animal possession and human-animal transformation. European colonization of North America inevitably involved the mapping of old stories onto a new world, in a complex process that reflected encounters between the diverse storytelling traditions of countless locales across the Eu-

ropean continent, a multiplicity of indigenous narratives spread across the Americas, and a wide variety of African traditions that the hegemonic power of slavery could never entirely suppress.⁶¹ In his study of wolf narratives, S. K. Robisch has suggested that “as with many of the myth collisions that occurred during European colonization, the werewolf mythology of Germany, France, the British Isles, and later legends imported by the British Raj or eastern European immigration found its way into a land already possessing a complicated demihuman mythology.”⁶² Multiple authors have also pointed to a likely relationship between rabies and European werewolf stories, including possible ties between epizootics and the werewolf trials that accompanied the witch hunts of the late medieval period.⁶³ Although European witch trials passed their peak by the end of the sixteenth century, occasional reports of werewolves and other phenomena involving human-animal transformation still appeared in the mid-nineteenth and early twentieth centuries.⁶⁴ The story of how and why Peyron murdered his wife lay at just one remove from such accounts.

Animals’ place in the Puritan witchcraft trials of colonial New England provides one glimpse of the countless cultural pathways that produced the implicit association between rabies and animal possession in nineteenth-century newspaper stories. John Putnam Demos’s classic, *Entertaining Satan*, offers evidence of just how strongly animals figured in accounts of witchcraft during the second half of the seventeenth century. The Puritans knew that witches frequently caused unexplained sickness or death in domestic animals, and that they sometimes grew unnatural teats with which to suckle animals at their breasts. Witches also threw their human victims into fits, in which they might bark like dogs, cluck like hens, or make other animal noises. The Devil himself sometimes adopted the guise of an animal—for example, in 1672, he appeared to 16-year-old Elizabeth Knapp “in [the] form of a black dog with eyes in his back.”⁶⁵ Witches also transformed into animals or otherwise cast their aspect in animal form, and Puritans who felt endangered by *maleficium* reported unsettling encounters with animal “familiars.” The son of John Remington, the boy’s horse, and his dog all felt uneasy about a particular crow they came across in the woods, and young Remington “began to mistrust and think it was no crow.” Peter Pitford claimed that “Goodwife James was a witch and that he saw her in a boat at sea in the likeness of a cat.” Mary Parsons confessed nights spent among fellow witches in which “we were sometimes like cats, and sometimes in our own shape.”⁶⁶

Such beliefs in the fluidity between human and animal states carried into

the nineteenth century. Demos found a tale from nineteenth-century Rhode Island, in which a man suspected a cat of being tied to a witch. He shot the cat with a silver bullet; at the very same moment, the woman suspected of witchcraft fell and broke her hip. The story neatly echoed a seventeenth-century trial, in which Jonathan Woodman testified that he kicked “a white thing like a cat,” and Elizabeth Morse simultaneously had to seek a doctor’s care for a pain in her head.⁶⁷ Countermagical practices of the seventeenth century also had their nineteenth-century equivalents. At the 1658 trial of Goodwife Garlick, for example, one alleged victim of witchcraft testified to dealing with a sow’s suspicious death by burning the animal’s tail as a countermeasure. Similarly, a man in Salem, New Hampshire, some two centuries later believed his neighbor had hexed his cow, and he burned the ears and tail of the cow in response.⁶⁸

The burning of animal tails as a protective strategy, whether in cases of witchcraft in the seventeenth and nineteenth centuries or to protect oneself from rabies, raises the possibility of a common historical lineage at work. Although that hypothesis remains conjecture, the point here is not to prove a genetic link between seventeenth-century conceptions of witchcraft in colonial New England and nineteenth-century theories about rabies in New York newspapers, but rather to suggest the processes by which folk beliefs traveled across space and time. The Puritans’ own understandings reflected an old cultural inheritance. As David D. Hall has observed, even though the Puritans’ theological doctrine rejected patterns of thought that they considered pagan, their actual practices remained syncretic. The same tales of wonders that circulated in medieval Europe found their way into the lore of colonial New England, and the Puritans stood at the ready to detect the omens portended by meteorological events, natural disasters, extraordinary astronomical phenomena, and other signs of God’s will at work. The astronomical events whose meanings Increase Mather learned to divine derived from medieval texts that in some cases themselves depended on ancient sources; the Devil in the form of a black dog appeared in England at least a century earlier.⁶⁹ Imagine such acts of cultural transference repeated over and over again through the movements of individuals, families, and communities in different places and times, with stories and folklore passed down from one generation to the next, and new variations created through encounters between different groups and their diverse belief systems. Such possibilities hint at how nineteenth-century New York newspapers could produce with ease rabies narratives that contained implicit assumptions about animal possession and

animals' malevolent influence on humans. These unspoken presuppositions likely represented the distilled cultural remnants of countless migrations that carried local traditions from the European continent to North America, combined with African, Afro-Caribbean, and Native American influences, as well as ideas drawn from the cultural encounters of European colonialism on a global scale.⁷⁰ Rabies victims who barked like dogs or scratched like cats came from an unstated animism in the culture of nineteenth-century America.

The End of Suffering: Rabies and Mercy Killings

The etiology of suffering required explanation, whether through folk knowledge, medical description, or other ways of understanding how hydrophobia caused the human body to betray itself. The uniformly fatal course of the disease also forced reckonings with death and dying. As an illness that took its victims to the extremes of agony and hopelessness, rabies raised profound questions about the value of the final hours of a life spent in excruciating misery without any chance of release other than through death. When victims of animal bites first felt the dreaded symptoms or learned the fearful diagnosis of hydrophobia, they had to contemplate how to handle the ordeal that lay ahead. By the mid-nineteenth century, physicians possessed novel and powerful options to relieve pain, but rabies all too frequently defied their newfound confidence about medicine's ability to ease suffering. When ether, chloroform, laudanum, morphine, or other agents proved inadequate to stop or mitigate convulsions, doctors and family members faced grim decisions about whether the deliberate foreshortening of life was preferable to a natural death defined by the body's own power of self-torture.

Hydrophobia victims not infrequently sought death rather than have their torment prolonged. News stories reported multiple instances in which rabies victims begged physicians and caretakers to end their lives, or occasionally they took matters into their own hands before the disease struck with its full force.⁷¹ More often, however, when hydrophobia patients reached a point at which they preferred death to extended torment, they had to rely on the intervention of others. Not surprisingly, mercy killings had a subterranean quality in the nineteenth century, just as they do today. The pioneers of the mid-century anesthesia revolution cautioned that physicians should only practice pain relief and not bring about death, but broad-based discussions emerged in the 1870s about the possibility of ensuring patients ease of dying. Physicians came to no consensus about the morality or legality of euthanizing patients who faced agonizing illness and imminent death.⁷² At the same time,

euthanasia constituted an unspoken part of care of the ill by family members, as well as of medical practice.

It was one thing to talk in theoretical terms about the implications of euthanasia and quite another to speak openly of actual occurrences. Digging up an account from a distant, poorly verified past, in which smothering a rabies victim took place as a matter of course, provided newspapers one way to broach the forbidden topic. For example, in November 1860, a temperance advocate recalled that during his boyhood, he had read a terrifying story of a death from hydrophobia. According to the newspaper account of his comments, "At that time those who were supposed to have hydrophobia, were smothered between two feather beds in England, and the law justified the deed." In the summer of 1865, the *Brooklyn Daily Eagle* reproduced a story from a French journal that quoted a published account from 1830. The unnamed narrator told of a case in which the struggles of one man's ordeal "became so violent that his friends resolved to terminate his sufferings by suffocating him." They attempted their self-appointed duty with two feather beds, only to have their well-sweated, nearly asphyxiated comrade make a remarkable recovery when his wife intervened and pulled off the bedding. The startled witnesses could only come to the conclusion that hydrophobia-inducing poisons had been sweated from their friend's body. Two decades later, in Bloomington, New Jersey, Wilburn H. Sarolman recalled an old story from his past. Thirty years earlier, he and several other people partook of a local remedy after being bitten by a mad dog. All recovered, except a Mrs. Campbell, who had refused the treatment. She "was taken with hydrophobia and had to be smothered."⁷³ None of these particular accounts suggested that mercy killings occurred only in a benighted age now replaced by more modern, enlightened sensibilities, although other stories sometimes criticized the smothering of hydrophobia victims as an old and "barbarous" phenomenon.⁷⁴ In these instances, however, the past offered a safe place to acknowledge the existence of practices that could not be described too openly in the present.

Faced with the possibility of censure and prosecution, physicians resorted to veiled references and coded language on the rare occasions when they possibly discussed mercy killings in medical reports, treatises, and case histories. The American Medical Association's 1856 report on hydrophobia and its causes summarized findings based on 116 physician-supplied accounts from around the country. In the case of a 6-year-old girl from Easton, Pennsylvania, who died from hydrophobia in April 1848, Thomas W. Blatchford of Troy, New York, the organizationally active physician who authored the

AMA's report, noted the following: "It was supposed, Dr. Slough informs me, that the termination of the case was hastened by the use of chloroform by inhalation."⁷⁵ In a single sentence, Blatchford distanced himself from what might have been the euthanization of the girl by indicating his thirdhand knowledge of the facts, as well as his correspondent's own lack of certainty. "It was supposed," Dr. Slough said—as adept a statement of plausible deniability as there ever was. The circumspect observation that "termination of the case was hastened by the use of chloroform" also remained open to interpretation. It could imply either intentional use of anesthesia to cause death or premature death as an unfortunate side effect of an agent administered for pain relief. In just one cautiously worded sentence, Blatchford managed the complex juggling act of possibly writing about an actual instance of euthanasia, while simultaneously not writing about it at all.

An 1854 case history by Boston-area physician Charles D. Homans provides another opportunity to explore the coded language that could hide euthanasia in plain sight. Homans described his experience in tending a 15-year-old boy who lay dying from hydrophobia. His patient suffered extreme spasms that resisted treatment by ether or chloroform, although laudanum apparently eased some of his symptoms. Indeed, the boy appeared to rally briefly, but the next day his condition worsened, and "from that time the lad never had an interval of rest till death released him." The youth's paroxysms grew so severe that Homans and the other four attending physicians "decided to use force and cause him to inhale chloroform for the purpose of relieving his agony, which had now become excessive. He was accordingly enveloped in a blanket, after a severe struggle, and at 2-1/4 P.M., he breathed his last, while under the influence of this anesthetic agent." Note the carefully ambiguous description of "relieving his agony," a phrase that could conceivably connote simple pain relief or serve as a euphemism for deliberately ending the boy's life.⁷⁶

An inconsistent statement toward the end of Homans's case history perhaps points to the latter meaning. In discussing the tendency of treatment to exacerbate symptoms and suffering, Homans commented that in the case of chloroform and ether, "the only time they were tried, they caused such terrible spasms that it was very easy to promise the lad they should not be forced on him again."⁷⁷ But Homans and the other doctors actually did try chloroform a second time, during the youth's final half hour of life. Perhaps they simply decided to break their word and turn to sedation once more. One could also resolve the contradiction, however, by assuming that the purpose

of chloroform usage in the second instance differed from that of the first, and was intended to bring about death rather than relieve pain. The evidence is hardly conclusive, but that vagueness is precisely the point. Homans's narrative could be read as a clear admission of mercy killing or, in the face of potential disapprobation, indignantly defended as a misunderstanding over the administration of an anesthetic to relieve pain and convulsions in a patient's final minutes. The illicit nature of euthanasia required such deliberate obfuscation, in order to appeal to readers sympathetic to euthanasia, while also disarming opponents. Whether the physicians killed their patient to end his agony or sought to alleviate his symptoms until the disease took its natural course lay in the eye of the beholder.

Newspapers sometimes played a similar game, as in a February 1886 report of a 14-year-old boy's death from hydrophobia in upstate New York. According to the *New York Herald*, a "council of physicians" in attendance determined the case's hopelessness, and then "it was decided that as he had to die it would be better to end his dreadful sufferings at once." To this passive voice construction and its removal of direct attribution of responsibility, the *Herald* added an assertion of plausible deniability as well, in which the lad "was given chloroform and thus rendered insensible." That final phrasing suggested alleviation and mitigation to ease the process of dying, rather than outright mercy killing.⁷⁸

In news accounts during the second half of the nineteenth century, mercy killings also appeared sometimes as an acknowledged present-day reality. The *New York Times*, for example, recorded the same February 1886 case as a straightforward and deliberate effort to end a hopeless ordeal by administering death. Over the years, New York newspapers openly reported a handful of other cases in which physicians and family members agreed to end the suffering of children and youths by smothering them to death. In the spring of 1867, for example, a young girl in Greenfield, Michigan, developed hydrophobia from a dog bite and underwent "the most intense suffering." No palliative measures relieved her agony. In the end, "a consultation was had by physicians, who decided that, as the sufferer could not possibly survive, every consideration of humanity demanded that her sufferings be ended by some means, in accordance with which, during a severe paroxysm, the child was smothered to death." Other accounts from the 1870s and 1880s similarly testified to intended and actual mercy killings of children dying from hydrophobia.⁷⁹ Such incidents avoided both editorial condemnation and adverse legal consequences for the physicians and caretakers involved. The matter-of-fact

tone of news reports suggests a quiet consensus that in cases of extreme and prolonged suffering, particularly among the young, medical practitioners and family members rightly intervened to ensure a quick, merciful end.

At the same time, Americans could find no way to translate an unstated consensus into an openly acceptable and legally sanctioned practice. Medical and legal professionals across the country discussed the question of euthanasia with increasing urgency in the last third of the nineteenth century, and they identified the main legal and ethical dilemmas that have continued to define debates over legalized euthanasia down to the present. As medical ethicist Ezekiel J. Emanuel observed in the mid-1990s, “The arguments and justifications advanced both for and against euthanasia have hardly changed in over a century.” Advocates emphasized the abatement of needless suffering, especially when patients themselves wanted a quick death. Critics stressed that legalized euthanasia would inevitably lead to abuses, and that physicians frequently erred in their diagnoses and assessments of death’s imminence. Whether euthanasia constituted a form of mercy or an act of murder defined a basic philosophical division, as did the relative merits of human intervention versus allowing nature or divine will to take its course.⁸⁰

Discussions in New York City echoed the national and transatlantic debate. In 1881, physician John G. Johnson read a paper on anesthesia before the New York Medico-Legal Society, and toward the end, he asked “whether a physician has the right to administer anesthetics to mitigate death agonies,” particularly in the case of a disease such as hydrophobia, which produced such extreme duress. Could a physician “alleviate this suffering when the patient may pass away suddenly from the chloroform?” Johnson noted the case of a missionary convicted in London for administering fatal doses of morphine to terminally ill patients, but the question remained as to the prerogatives of a doctor: “Would the physician who intentionally administered chloroform enough to a hydrophobic patient to cut short his suffering come under the same rule?”⁸¹

Johnson raised the matter in the hopes that the Medico-Legal Society would establish a clear professional position on euthanasia. Three months later, in March 1882, the organization took on his challenge and debated the issue in a special meeting devoted to the legal implications of chloroform, but came to no firm conclusion about accelerating death for terminally ill patients in extreme states of misery. According to the *Brooklyn Daily Eagle*’s account of the discussion, Amos G. Hull, a former judge, contended that in the abstract, a physician had the right to terminate the life of someone dying from

hydrophobia, but in practice “it would . . . be impossible to formulate a law on that subject which would not be liable to great abuse.” E. C. Spitzka, the prominent New York neuroanatomist and alienist who had gained national notoriety the previous year for his testimony on insanity in the trial of Charles J. Guiteau for the assassination of President James A. Garfield, agreed with Hull. Another of the judges, however, considered euthanasia tantamount to murder.⁸²

The controversy continued in subsequent years. In 1886, in response to reports of mercy killings in hydrophobia cases in upstate New York and Chicago, the *New York Medical Journal* took a decided stance against the practice and worried that particularly “in many rural regions a barbarous practice, not uncommon in past generations, finds surviving advocacy, not only among the rustic populace, but even with some practitioners of medicine.” Euthanasia, the journal concluded, remained out of bounds: “Despite the emotional argument which holds it as a doctor’s highest duty to painlessly put an end to his clients when his prognosis is hopeless, the fact that a person is certain to die of disease is not acceptable as a valid excuse for killing him or her by adventitious means.”⁸³ A decade later, in 1897, a discussion of euthanasia at the Brooklyn Philosophical Association underscored the persistence of disagreement. One of the officers of the New York Medico-Legal Society “declared positively that he knew of two cases in which the attending physicians had killed their patients as an act of mercy.” Neither case involved hydrophobia, but both appeared equally hopeless, and under such circumstances, some physicians stood ready to take matters into their own hands. Nonetheless, although many might have agreed in theory on the appropriateness of mercy killing, a “right to kill” remained resistant to legislation. As the *Brooklyn Daily Eagle* pointed out, despite the best of intentions, “we encounter the risk of sacrificing a life that might be saved.” Mercy killing also risked granting “a great deal of power in the physician to make him the arbiter of a person’s fate.”⁸⁴ Similar themes defined the Medico-Legal Society’s discussion of euthanasia fifteen years later, in the fall of 1912.⁸⁵ Just as Judge Hull had concluded back in 1882, the ethical case for euthanasia could not surmount the inevitable problems with entrusting fallible, and occasionally malicious, humans with the power to administer death.

Today, “physician-assisted suicide” has replaced “euthanasia” as the preferred term in contemporary discussions in order to underscore the patient’s voluntary consent and participation in ending his or her life, and the spread of technological means to extend life at the expense of quality of life has high-

lighted a distinction between withdrawal of treatment and the deliberate use of drugs to cause death. Nonetheless, the central concerns surrounding mercy killing and the question of a “right to die” remain today much the same as what they were in the late nineteenth century. Surveys of medical practitioners show that physician-assisted suicide occurs regularly as an open secret, even though the practice remains illegal in all but a handful of states.⁸⁶ Most of the United States relies on the functionality of that open secret, which tacitly allows euthanasia for willing patients whose condition appears hopeless, but preserves the threat of prosecution lest physicians or others reach too quickly for death on grounds other than the dying person’s desires and best interests. As Donald McKinney of the New York State Task Force on Life and the Law observed in 1994, “A deliberate act to assist someone in taking his/her life—however merciful the intent—should not be sanctioned by law. Rather it should be left a private act, with society able to be called in to judgment when and if the motive should be impugned. This is not a neat and precise system of justice to be sure, but one that continues to afford the least possibility of abuse.”⁸⁷ The uncertainties of quiet community sanction may not offer enough guidance to satisfy those who want clear, concise regulation. Tacit cultural arrangements, however, do provide a sociological means for dealing with intensely difficult and highly personal decisions that defy legal codification even after well over a century of discussion. Human rabies cases, thankfully, have become so rare in the United States that they no longer impinge upon debates over euthanasia. The vexed questions of what constitutes a life worth living and of how much power physicians and patients should have to bring life to a close, however, remain as fraught as ever.

Dying Well, Dying Badly: Hydrophobia and the American Search for a Good Death

In cases of hydrophobia and other dreaded and hopeless conditions, euthanasia offered the prospect of a humane, compassionate alternative. More than simply a way to avoid suffering, it signified the more positive possibility of a good death, in accordance with prevailing notions of what it meant to die well. Throughout much of the nineteenth century, Americans understood the idea of “the Good Death” as a set of guiding principles for contemplating one’s mortal end. Derived from the *ars moriendi* tradition that dated back to medieval Europe, the Good Death defined an ideal standard for the performance of dying as both an art and a means of guaranteeing safe passage into the beyond. In its most Christian form, it emphasized the need for a person

to die peacefully, in a state of contemplation, acceptance, and salvation, and surrounded by loved ones who could not only provide care, but witness and evaluate the spiritual state of one's final moments. As Drew Gilpin Faust has observed, "An easy death suggested the calmness, resignation, and quick passage to heaven that the bereaved so eagerly hoped for." By contrast, "Reports of painful, terrifying deaths offered powerful warnings."⁸⁸ Death mattered not simply as the end of life, but augured the state of one's being for all eternity.

Although the concept of the Good Death suggested the existence of a singular, monolithic ideal of how to die, nineteenth-century American culture actually imagined many a good death. According to Mark Schantz, "Americans were so well armed with models of 'good deaths' that death itself was made to seem instructive, redemptive, and even glorious. . . . Indeed, Americans celebrated the deaths of the old, the young, and those cut down in their primes. They also made room in their narratives for those who died away from home. . . . Above all, Americans celebrated a disposition of resignation and acceptance in the face of death."⁸⁹ In an era that extolled masculine feats in combat, a good death could include both worldly glory on the Civil War battlefield and a quiet passing at home. After the Civil War, visions of death became increasingly secularized. Victorian culture still prized a deathbed ritual of mental preparation, calm acceptance, attention of loved ones, and the foresight to put one's affairs in order, but divorced from overt religious content. Funeral addresses and memorial biographies increasingly emphasized worldly achievement over the deceased's relationship with God. At the same time, religious treatments of death persisted in the post-Civil War decades, but they also shifted as mainline Protestant practices toned down the threat of hellfire in favor of a sunnier theology that emphasized the joys of the afterlife. By the end of the nineteenth century, a torturous death's fretful connotations of a troubled hereafter may have waned, but the ideal of a peaceful, pain-free death in the presence of family and friends remained.⁹⁰

One can hardly think of a disease that defied hopes for a good death, in whatever form, more than rabies. All too frequently, hydrophobia deprived its victims of any semblance of an idealized death, by inflicting uncontrollable agony and stripping persons of self-control and dignity. Those who were more fortunate experienced a period of lucidity before slipping into a coma and dying, or they responded well to anesthetics. New York newspapers reported on countless cases, however, in which sufferers lacked even these barren forms of luck. Instead, rabies patients frequently endured ceaseless convulsions, unrelieved by any medical treatment, until the point of death.

In some cases, hallucinations and delirium compounded victims' physical suffering and further compromised their ability to come to terms with their impending demise. In *Madness and Civilization*, Michel Foucault trenchantly recognized the association with animality that characterized discourses about madness in France from the seventeenth to the early nineteenth century. For the French asylum, Foucault observed, "The animality that rages in madness dispossesses man of what is specifically human in him," namely, of reason.⁹¹ Such a feared loss of humanity, in the form of rabies victims who barked and snapped like dogs, mewed like cats, or came to resemble monsters more than persons, added to the terror of hydrophobia and its dreaded potential for death in its worst form.

Capsule news summaries of rabies cases from around the country allowed New Yorkers to draw their own conclusions about the nature of victims' deaths. When James Hallcuss of Missouri died from hydrophobia in 1854, readers of the *New York Times* only needed to learn that "for thirty-six hours [he] suffered all the horrors of madness, when death closed his miseries," to know that Hallcuss had died badly.⁹² A similar shorthand characterized other news reports over the decades. In November 1885, for example, the specter of animality lingered over the final moments of Annie Farrell, who "looked like a wild beast gasping for breath" as she died in Newark, New Jersey. Pound-keeper George Neall, also from Newark, may have experienced a similarly hard death a year later. According to the *Brooklyn Daily Eagle*, "His death occurred immediately after a series of terrible spasms, in which he was delirious." Loss of mental faculties combined with uncontrollable convulsions connoted a decidedly bad death, but a competing account from the *New York Tribune* suggested a more comforting scene in Neall's final moments, in which he "passed away quietly and peacefully."⁹³ For Americans in the late nineteenth century, the lack of opportunity for quiet reflection and disciplined preparation for death, the extreme physical suffering until the very end, and the absence of calm farewells to family and friends signified the particularly abject character of these deaths.

Such values might seem to conform to present-day sensibilities, but Victorian culture placed a particularly high value on the performative aspects of dying. Robert V. Wells has aptly described the enormous significance attached to "the final scene in the pageant of death" during the second half of the nineteenth century. Dassia N. Posner has also observed that "the Victorian sentimental culture of death and mourning . . . placed great emphasis on final deathbed scenes and on the ritualized laying out of the dead body."⁹⁴

Newspaper stories of rabies deaths therefore need to be read not as mere factual accounts, but as narratives that conveyed the almost theatrical conventions of dying in accordance with cultural expectations and values.

Rabies usually precluded dying well, but where newspapers found the opportunity, they produced moving stories about good deaths from hydrophobia that could grab readers with their power to instruct, entertain, and surprise. Particularly in the 1850s and 1860s, before secularized narratives of death and dying grew more dominant, matters of the spirit occasionally pointed to the strange and glorious possibilities of the end of life. The 1850s offered some striking accounts of how the hydrophobia victim might mediate between this world and the next, as part of the pageantry and spectacle of a good death. In 1854, for example, 17-year-old Warren Moore of Greenfield, Massachusetts, was bitten by a dog who belonged to an occasional employee of his father. Eight weeks later, when symptoms first set in, he experienced a mild and vague illness along with an otherworldly premonition of his own death. According to the *New York Tribune*, "As his mother passed him, while he was combing his hair before a mirror, he said to her that that was the last time he should do that, for he was going to die. He also proceeded to give directions as to the disposal of various little matters of his to his several friends." Although his family was caught by surprise, Warren Moore made ready to die. Symptoms of hydrophobia then set in, and Moore suffered from spasms during which "his agony was awful and his screams terrific." Between spasms, however, he remained "perfectly rational . . . and requested that he might die on the lounge in the sitting-room, with his head in his mother's lap." Apparently, his death came as he hoped it would: "A little before his death he motioned to his mother to sit by him; she did so, and he put his head into her lap and soon expired."⁹⁵ This scenario included the conventional elements of a good death—planning, foresight, calm acceptance, the presence of a loving family member, and a well-chosen setting for the end. In particular, the young man's insistence upon the carefully composed, portrait-like arrangement of himself and his mother indicates how he undertook his death as a final performance, one that would culminate in an idealized, even beautiful, tableau at the moment of departure from life. The extraordinarily theatrical character of Moore's death might have been startling enough even by Victorian standards. Beyond the staged elements, the eerie presentiments added a powerful spiritual dimension that suggested Moore had already begun to cross over into another plane of existence well before death came.

Four years later, the death of Sarah Ellen Wooder, a young girl in Peoria,

Illinois, also dramatically illustrated a mid-nineteenth-century understanding of death as the point of contact between the earthly world and the after-life. The *Tribune* provided an elaborate account of her final hours:

Some four hours previous to her death, and soon after one of her most violent spasms, she told her mother that she had been visited by the spirit of her sister (the family are believers in Spiritualism), who left this earth for the better land about one year since, and that this sister had informed her of certain remedies, which, if applied, would relieve her sufferings and smooth her passage to the tomb. The remedies were applied as soon as possible, and, strange to relate, the desired effect was produced. She was freed from the convulsive fits, was enabled to breathe easier, converse freely with her parents and friends, occasionally drinking a little water, and finally falling into her last sleep, as gently as an infant reposing in her slumber.⁹⁶

For those who saw death not as a final end but a journey from one life to the next, the dying already possessed access to the hereafter. From the standpoint of her family and friends, Sarah Ellen Wooder's preternatural contact with her sister not only reassured them of the validity of their beliefs, but also brought young Sarah a good and peaceful death.

Such accounts of worldly access to the afterlife reflected the vogue of spiritualism that rose in the 1840s and lasted well into the early twentieth century. A more traditional emphasis on making one's peace with God upon the deathbed also entered into mid-nineteenth-century rabies narratives. Samuel Woodman, an Ohio farmer, was bitten by a dog in September 1859 and developed hydrophobia four months later. When symptoms first developed, the attending physician advised him to make out a will. Woodman did so, and he prepared himself mentally for what was to come. Although he suffered the convulsions typical of the disease, the *Dayton Journal's* account of his passing highlighted the gentler human aspects of Woodman's final hours. The paper reported that he "seemed to be in the possession of his faculties, spoke of his approaching death with calmness, received his friends with much warmth of feeling, soliciting the prayers of every one, saying that he trusted God had forgiven him his offenses. He died, as already stated, at six o'clock last evening."⁹⁷ Acceptance, the orderly settling of affairs, prayers, faith in God, and the warm comfort of friendship allowed Samuel Woodman to die a good death.

By the late nineteenth century, secularized accounts of a good death gained ground over the earlier emphasis on the religious and spiritual aspects of the

art of dying. When Jacob Hertline died from rabies in 1886, for example, New York's newspapers portrayed his last moments as an ideal Victorian death. Hertline, a Brooklyn builder, contracted hydrophobia in the spring of 1886. He suffered unspeakable pain despite generous doses of morphine, and his doctor told reporters that Hertline was "continually crying for poison" as the disease ran its inevitable course.⁹⁸ Toward the very end, however, Hertline, his family, and his friends could enjoy some sense of consolation in the final manner of his passing. The *Brooklyn Daily Eagle* described a serene setting at the deathbed: "The last half hour of life was peaceful, as nature had been exhausted by the spasms and the vital spark was flickering away. The dying man knew the friends and relatives who were grouped around his bedside; he bade his wife and children an affectionate farewell and laying his hand on the arm of a neighbor said: 'I know you are my good friend.' These were the last words he spoke." The *New York Tribune* documented a similarly warm and tranquil scene toward the end.⁹⁹ Both stories melded facts, sentimentality, and the appropriate rhetorical flourishes to produce the perfect Victorian death for Jacob Hertline: a genteel domestic setting, readiness for the end, fond goodbyes, and a quiet, peaceful passage into the beyond.

Readiness for death constituted a key aspect of dying well, but rabies underscored both the virtues and limits of preparation in victims' efforts to secure a good death for themselves. In the fall of 1889, Gilman A. Kimball's final days in Danvers, Massachusetts, illustrated how hydrophobia could so easily thwart completely a patient's best efforts. Kimball developed hydrophobia three weeks after being bitten by his own dog. According to a newspaper account, he "was very deliberate and rational about his condition," and he took steps to ensure a good death for himself. The *Indianapolis News* reported, "He went to Boston and bade his customers goodbye [*sic*], telling them he was about to die. He wrote a letter to his wife, saying he had the hydrophobia; that he would try to control himself so as to injure no one; that he wished her to remain with him to the last but if he became violent to give him something." Despite these measures, however, Kimball could not dictate his fate and assure himself a smooth journey into his life's end. On the final day, as a group of men tried to hold him down while unbearable spasms wracked his body, "he begged them to kill him, crying out for more of the morphine which had been used to quiet him." Hours later, he was gone.¹⁰⁰ Ultimately, the disease remained capricious and resistant to human will, and no amount of preparation could determine whether one's life would end peacefully or in excruciating suffering.



Hydrophobia left a distinctive mark on the experience of suffering and dying from infectious disease during the second half of the nineteenth century, by forcing reckonings with the extreme forms of physical pain and loss of bodily control that the scourge inflicted upon humans and animals alike. Americans integrated the disease into their broader cultural systems of myth and folklore, and they projected onto it their largely unspoken beliefs about mysterious spiritual forces that tied humans and animals to rabies and the dogs who spread it. Finally, hydrophobia raised the most difficult and intimate questions about the limits of human will in the final days and hours of life. Although the disease sometimes allowed for a good death in accordance with nineteenth-century hopes and ideals, more often it seemed to guarantee a prolonged and agonizing process of dying. Yet the ethics of deliberately ending a life that offered nothing but excruciating suffering before death arrived on its own remained perplexing and unresolved.

Remedies and Materia Medica

Medical Authority, Political Culture, and Empire

In June 1872, the *New York Tribune* offered a humorous commentary on the endless variety of hydrophobia remedies in circulation in nineteenth-century America. The paper's puckish depiction of medical advice boiled down the full range of treatment options to eight steps: "This is the time for publishing the various cures of hydrophobia, but a catalogue of all of them would be too much for the crowded state of these columns. When a patient is seized with this disease: 1. Inject morphine under the skin. 2. Give half a dram of powdered castor internally. 3. Administer small quantities of chloroform by inhalation. 4. Wrap the patient in blankets saturated with a warm solution of nitrate of ammonia. 5. Apply oil of juniper externally. 6. Administer vapor baths. 7. Put the patient upon a diet of raw onions. 8. Try the mad-stone, if you can get a specimen of it. If the dog was mad, this stone will adhere to the wound."¹

This jumbled assortment of therapeutics captured perfectly the medical gamut of the era. Nitrate of ammonia, with its diuretic properties, belonged to the materia medica of regular physicians' chemical arsenal, although by the 1870s it served solely as a precursor ingredient for preparing nitrous oxide. Powdered castor likely referred not to a castor plant derivative, such as castor oil and its purgative properties, but to the castor sac of the beaver, long recognized in medical tradition as a musk-like substance with antispasmodic and stimulative effects. Chloroform and morphine signified the new and powerful anesthetics, sedatives, and painkillers that came into common usage in the middle decades of the nineteenth century. Regular physicians recognized juniper as a stimulant for the stomach and the kidneys, but oil of juniper also suggested the ministrations of folk medicine and botanic medical practitioners such as the Thomsonians. Likewise, regulars extolled

the virtues of vapor baths under appropriate conditions, but their most ardent support came from advocates of hydropathy. Raw onions invoked household traditions of healing, and madstones reflected particular regional manifestations of folk belief.²

Over the decades, these and other sundry rabies remedies peppered the column space of New York City's daily newspapers. Their heady mixture of advice sheds light on the convoluted nature of the American medical landscape in the middle decades of the nineteenth century, an era of rapidly expanding therapeutic possibilities, as well as new ways of thinking about disease and the body even before the ascendance of germ theory in the 1880s and 1890s. Historians have learned in recent decades to avoid turning the medical past into a mere catalog of what people got right or wrong at any given juncture. Rather than indulge and privilege present-day biases, the challenge is to make sense of medical reasoning and belief systems that might otherwise seem alien and unworthy of attention. As John Harley Warner once admonished, "Instead of dismissing antebellum therapy as either risible or tragic, the historian should endeavor to understand what made it meaningful."³ His observation applies equally well to the decades after the Civil War, when hydrophobia treatments continued to draw from a broad medical and cultural repertoire. Many of these curative measures might seem quirky or outlandish according to both nineteenth-century standards and present-day judgments, and as critics in the historical past frequently protested, most prophylactic measures only "worked" because the feared bite came from a non-rabid animal in the first place. But nineteenth-century rabies treatments also made intellectual sense within the competing therapeutic contexts of their times, and they reflected specific challenges and circumstances, including battles over medical authority, problems of knowledge and truth in a democratic political culture, and the significance attached to natural objects in a global imperial order, that render the question of their efficacy, or lack thereof, the least significant and interesting part of their history.

The vast array of remedies that informed both medical and popular discourses arose from social and cultural settings that tied together diverse modes of medical thought and practice across the divides of time, space, and community. Traditions of domestic medicine in the nineteenth-century American home, for example, relied both knowingly and unknowingly on a pharmacopeia whose roots (not just figurative, but sometimes literal, given the plant materials involved) tapped into the *materia medica* of the early

modern period, or further back into Greek and Roman antiquity. Imperial expansion and global commerce also reached across space, in the form of intense interest in indigenous sources of knowledge that created a thriving global traffic in plant- and animal-based products with medicinal applications. The natural history tradition of the *materia medica*, as a form of science that lent legitimacy to a variety of American folk remedies, physicians' recommendations in early nineteenth-century domestic medicine, and the imperial search for new cures from distant and exotic lands, also worked to enmesh competing forms of medical doctrine and healing practices. The result was a body of knowledge that, while hardly seamless, integrated wide-ranging treatments and conceptions about the restoration and maintenance of health into the common healing practices of laypersons and physicians from different medical sects.⁴ Consequently, as much as regular physicians sought to drive out Thomsonians, homeopaths, Eclectics, and other nonallopathic practitioners, they depended too much on the same ingredients from the *materia medica* to distinguish themselves sufficiently from their competitors as the sole repository of legitimate medical authority.

Instead, this diverse medical environment made syncretism the name of the game, especially with a disease as incurable as rabies, for which no claims of efficacy ever surmounted the malady's reputation for fatality. Since nothing worked, everything became possible. Yet some remedies emerged as more possible than others, based on their ability to navigate different social and cultural environments and the theories they offered about health and its maintenance. In a democratic society, a seemingly endless array of therapeutic options placed difficult decisions before self-governing individuals at every turn, yet the medical guides that encouraged laypersons to develop their own powers of discerning judgment existed in uneasy tension with regular physicians' claims of exclusive possession over authoritative knowledge. Reports about madstones and their wondrous ability to cure hydrophobia challenged city dwellers in the age of Barnum to distinguish truth from bunk. Water cure brought together constituencies from allopathic medical circles, enthusiasts of natural healing methods, and supporters of animal welfare. As we will see, varied and sometimes competing cultural and social registers sustained myriad approaches to curing hydrophobia, even as a broad consensus simultaneously recognized that symptomatic cases of rabies remained completely resistant to treatment. Within the convoluted cultural terrain of hydrophobia remedies, ideas about disease, bodily health, and the foundations of thera-

peutic choice converged with matters of belief, power, and authority amid the anxieties and possibilities of a democratic society and an increasingly integrated global order.

Rabies and Medical Consensus in the Mid-Nineteenth Century

The mid-nineteenth-century world of rabies remedies cannot be comprehended without first appreciating the era's perspectives on the nature of disease, particularly the complex relationship between constitutionalist and contagionist ideas that shaped medical understandings of hydrophobia. Throughout much of the nineteenth century, American physicians conceived of disease as primarily the result of disruptions and imbalances in the body's constitution, and only rarely the product of a discrete disease agent or specific condition. Diseases were fluid states in which, as Warner has observed, "a host of environmental influences could nudge one disease into another" and "a single disease could take on a variety of forms." Local geography and climate also exercised a powerful influence, and the conservation of health therefore required a proper equilibrium between the individual's temperament and the local environment, topography, and climate. Conevery Bolton Valenčius has explained how medical perception informed American views of the land itself, in which the dangerous bubbling and oozing of miasmatic swamplands signaled the boils, swellings, and fluid emanations that came with illness and the body's efforts to restore its internal balance.⁵

In the case of rabies, constitutional and climatic factors explained how the condition could suddenly emerge in dogs, or how hydrophobia could manifest itself in humans long after a dangerous animal bite. As New York physician and pharmacist Lewis Feuchtwanger explained in 1840, "The excitement of vehement rage, putrid food, long-continued thirst, severe and pinching hunger, hot and sultry atmosphere, are the only probable and most natural causes" of the disease in dogs. In humans, "the specific virus of Hydrophobia" could lie in wait, dormant, until the disruption of "an excitement to enable it to carry out the process of assimilation." Feuchtwanger also cited the opinion of a medical colleague in the city "that Hydrophobia may be spontaneously generated by violent emotions of the mind—sorrow, fear, rage, fright, the want of food, extreme fatigue, &c."⁶ Thus did the body's constitution provide the environmental conditions for an animal poison to exercise its effects, or even generate the disease *de novo*.

The constitutionalist perspective did not rule out contagion and disease specificity entirely, however. Feuchtwanger's reference to a "specific virus of

Hydrophobia” indicates the interplay between constitutionalism and disease specificity. Rabies was one of a handful of conditions that nineteenth-century physicians considered contagious in nature and caused directly by a poison in the saliva of the biting animal, and not a generalized disequilibrium in the body. Contagionist explanations for rabies were already well established in the 1840s and 1850s, and they only grew stronger in later years with the impact of the Paris school and its effort to correlate symptoms with localized lesions, combined with the rise of thermometry, chemical analysis, and other new techniques for defining and measuring abnormalities in the body’s economy.⁷ Hence, decades before the ascendance of germ theory, American physicians considered rabies a contagious disease spread almost exclusively by inoculation of saliva from the bite of a mad animal. For example, in 1856, Thomas W. Blatchford’s special report on hydrophobia for the American Medical Association ruled out connections to dogs’ food or drink, or to “some peculiar influence of the air,” and stressed that “genuine rabies . . . *never proceeds from any other cause*” than transmission from the bite of an animal.⁸ Nearly two decades later, New York sanitary inspector Charles P. Russel, in his lengthy review on hydrophobia for the Department of Health, also dismissed theories of canine madness as a product of unfulfilled sexual impulses, consumption of spoiled food, unmitigated thirst, or meteorological conditions. Instead, he emphasized that hydrophobia’s “*reproduction solely by inoculation from one animal to another* is . . . the only satisfactory theory left us . . . and in all probability such mode of transmission is responsible for every case.”⁹

But this recognition of rabies’ contagious nature existed as a composite with constitutionalist principles. For Blatchford, contagion explained virtually every known case of transmission, and he cited experimental evidence showing that rabies never followed from dogs’ thirst or consumption of rotten meat as popularly supposed. The original source of the disease and dogs’ “peculiar liability to rabies,” however, remained in question. For that, one needed to look to dogs’ “*constitutional irascibility*” and the “excessive irritability” that characterized the canine temperament. Consequently, some dogs with more extreme temperaments were, by their nature, “constantly in a state bordering on madness,” and Blatchford speculated that their individual constitutions created the physiological conditions in which “a rabific virus capable of originating the disease may be produced.” He went on to compare the short-term “rage or fury of mere passion” with its “morbific and permanent” counterpart in rabies and mania in order to postulate how powerful anger in

the dog might generate disease. The resemblance between an enraged dog and a rabid dog, Blatchford suggested, made it “reasonable to conclude that the functional condition of the organs implicated in the disease, the very organs in which it is supposed the virus is generated, is in both cases very similar, and therefore capable of generating the virus. That the bite of such an animal should be followed by rabies is a most rational conclusion.”¹⁰

J. Lewis Smith, Blatchford’s contemporary and someone he likely knew as part of their mutual activities in New York medical circles, similarly combined a constitutional understanding of hydrophobia with notions of disease specificity. In the mid-1850s, long before he became a leading figure in pediatric medicine, Smith helped to build his career as a rising young physician by publishing a remarkable hydrophobia treatise, in which he culled through the medical literature, identified 131 rabies cases that he considered genuine, and offered an extensive analysis.¹¹ Unlike Blatchford, Smith thought no convincing evidence existed for transmission of rabies by an angry but otherwise healthy animal, but he wondered whether teasing and provoking dogs that were already ill might “render the poison more energetic and increase the danger of infection.” He also believed that hydrophobia could appear spontaneously in both dogs and humans, although in the latter, such cases “must be very rare.” Overwhelmingly, inoculation by animal bite constituted the predominant mode of transmission. Constitutional factors, however, explained whether exposure led to active disease. Smith noted cases in which precipitating events, such as “exposure to wet,” “eating fish having a strong odor,” “drunken revels,” various shocks such as “witnessing the execution of a murderer” or sudden fright, and one victim’s experience of being “highly irritated . . . by the opposition of an aunt, to her marriage” led to the onset of symptomatic cases. Consequently, recipients of suspicious dog bites needed to guard their health by leading “a quiet and regular life,” and avoiding all excess in order to ward off the development of deadly symptoms.¹²

Nor were such considerations confined to the antebellum period. In the 1870s, the British veterinarian George Fleming, whose widely quoted hydrophobia treatise shaped understanding in English-speaking settings on both sides of the Atlantic, similarly emphasized the need to boost the spirits of dog bite victims and prevent them from lapsing into despair, since mental conditioning might well determine at least part of the difference between dog bite victims who remained healthy and those who died from hydrophobia. Russel also pointed to physiological and mental conditions that might make the onset of symptomatic rabies more likely in particular persons, including “constitu-

tional debility, previous ill-health, the fright experienced at the time of the injury, fear and anxiety entertained afterwards, venereal and other excesses, exposure to the direct rays of the sun, depressing passions and injury to the cicatrix." By contrast, "a vigorous constitution and absence of all apprehension and causes of mental depression or bodily exhaustion most likely prolong the period of latency, or successfully interfere with the escape of the poison [from the wound site]."¹³ The bite of a rabid animal constituted the key risk factor in all cases except for the extremely rare instances of spontaneous hydrophobia, but individual constitution still mattered in determining whether or not someone developed an active and deadly illness.

Although the idea of disease specificity and transmission through clearly defined routes as more general phenomena gained greater acceptance by the 1870s, physicians still resorted to the possibility of spontaneous rabies, spawned somehow within the healthy body, in order to explain anomalous cases that lacked any known history of animal bite. Fleming pointed to the sudden appearance of canine rabies cases in areas long free of disease, or in dogs isolated on farms or in family homes, to bolster the case for spontaneous occurrences. Scientific evidence that the virus became progressively weaker as it passed through multiple animals, he argued, also indicated the disease could renew itself only through periodic instances of spontaneous regeneration. For Fleming, although such cases were a rare, one in a thousand proposition, they formed a critical part of the etiology of hydrophobia.¹⁴ Other physicians, such as the esteemed New York neurologist William A. Hammond, believed that bites from healthy dogs could sometimes cause hydrophobia, as in the case of a woman who contracted the disease following an attack by a normal dog in heat. Hammond's ruminations on this point suggested the persistence of constitutional explanations. Charles P. Russel also hedged his bets by grudgingly conceding the possibility of spontaneous rabies in certain animals, while still emphasizing inoculation from animal to animal as the sole means of transmission. In the 1880s and 1890s, exceptional hydrophobia cases still generated debates about disease specificity, although by then most American physicians embraced germ theory and anticipated the identification of a live, microscopic agent as the cause of rabies.¹⁵

In addition to this general consensus about rabies as a contagious disease spread primarily, if not exclusively, through inoculation with the saliva of an infected animal, American physicians in the mid-nineteenth century also agreed that either cauterization, whether by chemical means or with a red-hot iron, or excision of the wound offered the only effective means of preven-

tion. Such strategies for treating poisonous bites dated at least as far back as Celsus's *De Medicina* in the first century CE, and they connoted the continued significance of classical learning to nineteenth-century American medicine. Knowledge about this mode of rabies prevention spread widely among the general public as well as in medical discussions. In New York City, newspapers periodically reminded readers to have suspicious bite wounds treated, and cauterization remained the first line of defense until Pasteurian rabies vaccination became readily available in the city in 1890.¹⁶ Physician-authored treatises also explained the theoretical reasoning that cauterization and related techniques would either destroy the rabific poison outright or prevent its spread elsewhere in the body, and statistical evidence suggested the efficacy of such measures.¹⁷ Even after the development of Pasteur's technique for rabies vaccination in 1885 and its ready availability in New York five years later, cauterization remained an important option, particularly in places without immediate access to the Pasteurian procedure.¹⁸

When prevention failed, medical consensus underscored the inevitable deadliness of the disease. As one physician summarized the state of the art in the *New York Medical Journal* in 1881, "In the few cases chronicled as cured there have invariably been good grounds to question the diagnosis. . . . It is safe to say that in no case of undoubted rabies has death failed to result speedily, and that there is no known cure."¹⁹ Yet, it was a rare physician who confessed that when faced with a hydrophobia case, "*Not knowing what to do, I did nothing.*"²⁰ Treatises stressed the need for the physician to act and to keep hope alive, even in the most hopeless circumstances, since somewhere, somehow, a cure had to exist.²¹ The possibility, however slim, that some reported instances of recoveries might actually be genuine also stimulated attention and interest in alternative prophylactic measures or cures from the wide-ranging world of materia medica and the blend of folk knowledge, physicians' claims, and medical sectarianism. These treatment options, as we will see, were deeply embedded within larger systems of scientific knowledge, American political culture, and imperial power.

Discerning Judgment and Therapeutic Choice: Materia Medica, Allopathic Authority, and the World of Nineteenth-Century American Medicine

Despite, or perhaps because of, the dark and foreboding consensus about the inevitable fatality of symptomatic rabies and the imperfect record of cauterization as the only legitimate recourse for prevention, ideas and recommen-

dations for treating or warding off the disease were widespread. In New York's newspapers, physicians and laypersons alike proffered their favorite remedies. A certain skepticism hovered over such claims, and commentators frequently pointed out that stories of cures meant that the alleged victims must not have had genuine hydrophobia in the first place.²² Nonetheless, reports of rabies preventatives and cures remained newsworthy, and the middle decades of the nineteenth century abounded with putative hydrophobia treatments and fervent guarantees of their efficacy. In addition to the traditional practices involving parts of dogs' bodies discussed in the previous chapter, herbal cures, everyday remedies that employed salt, vinegar, or other common household products, madstones, vapor baths, new anesthetics, other novel and powerful chemicals or drugs from the medical arsenal, and a growing array of plant-based preparations from places near and far all entered into medical and popular discourses about hydrophobia and its treatment. Amid this immense therapeutic diversity, allopathic physicians encountered multiple barriers in their efforts to claim the exclusive legitimacy of their expertise, particularly in a democratic society that prized self-governing individuals' prerogatives of judgment over deference to authority.

At first glance, the era's long list of assorted, and frequently strange, rabies remedies presents a dauntingly incomprehensible mishmash. Closer examination, however, reveals the interconnections and shared assumptions between different forms of medical practice, in which regular physicians' therapeutics continued to draw from traditional sources and the same *materia medica* as medical sectarians, even as allopaths sought to establish their brand of medical practice as superior to all competitors. Yet innovative possibilities also abounded, as developments in laboratory chemistry generated novel pharmacological possibilities, particularly when grafted to global imperialism and its quest for botanical resources. The interplay between medical authority and everyday health practices in a society defined by the ideal of democratic self-rule, the new therapeutic alternatives generated by medical chemistry, and the botanical dimensions of empire continually generated enthused pronouncements about the latest breakthroughs that promised to end the scourge of hydrophobia. By closely examining the supporting social, intellectual, and cultural contexts surrounding claims about rabies cures in the virtual spaces of New York newspapers and medical journals, and in their actual use in both the city and elsewhere, one can decode and make sense of the far-flung conditions, from the local to the global, that sustained the full medley of treatment options.

The diffuse nature of medical authority in nineteenth-century America supported a world of diverse therapeutics. Even among the limited set of persons who called themselves physicians, a label that excluded midwives, apothecaries, indigenous healers, and various other providers of healthcare, a broad range of practitioners defined the American medical landscape by the 1830s and 1840s. Early in the nineteenth century, growing skepticism about vigorous bloodletting and other forms of heroic intervention had already prompted the emergence of Thomsonian medicine, which rejected the poisons of so-called mineral remedies in favor of supposedly gentler botanics, along with hot baths and steam, in order to restore and maintain the body's equilibrium. The rescission of fledgling licensing requirements in the 1830s and 1840s, on the grounds that regulation empowered secretive monopolies unbefitting a democratic society, further opened the field of practice, and a whole host of Eclectics, neo-Thomsonians, homeopaths, hydropaths, and botanics of alternative persuasions entered a heated competition with self-declared regular physicians for legitimacy and patients in an era of intense medical sectarianism. In a political culture that emphasized free competition and the judgment of truth value by self-governing individuals, the choice of whether to rely on household remedies, folk medicine, water cures, the herbal regimens of different botanic sects, the mixed therapeutic practices of the regular physicians, or some combination of these and other options remained largely subject to individual taste and circumstance.²³

Probably no single group fought more assiduously for sole authority over medical practice than the regular physicians, but the nuances of their claims to exclusive legitimacy could not establish sufficiently the distinctiveness of their methods and conceptual apparatus from those of their sectarian competitors. Throughout the middle decades of the nineteenth century, regulars argued from a constitutional perspective that only a skilled and knowledgeable physician could properly tailor an individualized treatment regimen to a particular patient's constitution, temperament, and local environment. The same disease state might require radically different therapies for different people depending on the patient's own presentation—whether nervous or vigorous in appearance, for example—as well as local geography, seasonal conditions, and the current weather. Competing sects, according to the tenets of allopathic medicine, too readily and dogmatically denied the benefits of judiciously applied chemical compounds. In addition, single-minded endorsements of, say, water cures or simple, domestically available herbs as cure-alls smacked of quackery. Only quacks claimed to cure through formu-

laic regimens and standardized nostrums, whereas real physicians depended on discerning judgment and the ability to draw from the full range of the materia medica.²⁴

Regulars thus professed the superior nature of their skill, yet, as indicated by their therapeutic practices, they also emitted mixed signals at every turn. As Warner has shown, although regular physicians continued to employ venesection, strong purgatives, and other depletive measures to treat the sthenic, overexcited disease conditions that they observed, from the 1820s onward they increasingly counseled moderation as they shifted from heroic depletion to heroic stimulation.²⁵ Ordinary practicing physicians and laypersons alike consulted popular and widely circulated medical guides, such as Buchan's *Domestic Medicine* and Gunn's *Domestic Medicine*. These texts left room for heroic measures where appropriate, but much like the botanic physicians, they advised on the virtues of sustaining the body's natural and healthy equilibrium through proper diet and exercise. In addition to chemical drug regimens, regulars also employed many of the same plant-based treatments as the "vegetable materia medica" of the Thomsonians, homeopaths, and Eclectics.²⁶ Indeed, some regulars credited the sectarians for expanding the useful repertoire of the materia medica. Although practitioners from botanic sects may have tended more toward following recipes than applying individual discretion in their actual approach to treatment, regulars and unorthodox physicians frequently employed similar therapies, as well as similar conceptual frameworks about health and disease.²⁷

Regular physicians' own endorsement of the democratic political culture of the 1830s and 1840s further complicated their effort to herald the singular nature of their knowledge and medical command. By the 1830s, guidebooks sought to counter quackery by demystifying medical treatment and stressing general principles for sustaining health, which was supposed to lead lay readers to distrust, as American physician J. G. Norwood's 1838 edition of Buchan's *Domestic Medicine* nicely put it, "pompous prescriptions" and guarantees of "great cures."²⁸ But that mission also democratized the possibility of discerning judgment, by requiring readers to develop a feel for medical practice in order to administer remedies that, according to constitutional assumptions, could not depend on rote formulas. Buchan's *Domestic Medicine*, for example, stressed that "it is not an easy matter to proportion the doses of medicine exactly to the different ages, constitutions, &c. of patients," and therefore "a great deal must be left to the judgment and skill of the person who administers the medicine."²⁹ In 1835, the fourth edition of Gunn's *Do-*

mestic Medicine directed readers to rely on “common sense and matter-of-fact disclosures” as an antidote to the arcane pronouncements that quacks used to lull the unwary into credulity.³⁰ Like Norwood’s version of Buchan, Gunn also highlighted the value of “discriminating judgment.” Both texts warned readers against foregoing medical opinion when necessary. As Norwood’s preface admonished, Buchan’s *Domestic Medicine* was “not intended to induce people to neglect medical assistance, and place too great confidence in their own discrimination.”³¹ Yet the overall tenor of both texts suggested precisely that any person who adopted the right mind-set and proper reasoning could become his or her own doctor.³²

This cultural setting of widely diffused medical authority, divergent schools of thought, and the primacy of private judgment generated a dizzying range of substances and concoctions for preventing and treating hydrophobia. When word spread of rabies outbreaks, helpful newspaper readers freely offered the benefits of their knowledge, and editors published advice that seemed to merit notice, whether as mere curiosities or more worthy therapeutic possibilities. Favorite remedies mentioned in New York dailies from the mid-nineteenth to the early twentieth century included formulas based on the roots of the white ash tree in New England or the bark of the black ash in Kentucky, an old Greek remedy that used asparagus to induce sleep and sweating, ingestion of horseradish and sweet oil along with their application as a poultice, application of spirits of turpentine to the wound along with ingestion of turpentine in brown sugar, rose leaves “discreetly used,” and a decoction of broom top ashes infused in wine. In 1890, a woman from New Rochelle informed the *Tribune* that she had kept herself safe from hydrophobia by repeatedly applying a mixture of salt and vinegar to a bite wound from a suspicious dog, and in the early twentieth century, a Connecticut farmer sent to the New York City Board of Health his personal cure, which included rue, garlic, and other commonly available items as the key ingredients.³³

Another genre of vernacular therapeutics involved secret prophylactics and remedies, often closely guarded within families, that their purveyors guaranteed would prevent or cure hydrophobia. Some earned press attention as curiosities with distant origins, such as a regimen of unknown drugs and powders passed from one generation to the next in a family in Russia, an infallible treatment guarded by monks in Ardennes for eleven centuries, or a century-old family cure from the Netherlands.³⁴ Others came from closer to home, in accounts of local events or letters from well-meaning readers. In cases of requests for money in exchange for surefire treatments, the combi-

nation of furtiveness and pecuniary interest raised the specter of quackery and confidence games in an era obsessed with the figure of the confidence man and his capacity to con naive urbanites in an anonymous world of strangers.³⁵ But for most such correspondents, the value of their remedies lay in the allure of possessing something rare, mysterious, exclusive, and timeless. Some offered to share their secrets freely with qualified persons, as long as they pledged to maintain confidentiality. In 1868, for example, the *Tribune* published a letter from “G. W. B.,” who cited his authority as a longtime keeper of dogs and acquaintance with well-known surgeons, and invited surgeons with bite victims under their care to seek his counsel. “G. W. B.” requested contact from “professional men only . . . relying on their honor to keep the secret.” Others insisted on preserving their monopolies on arcane knowledge but provided treatment without charge, such as the Brooklyn dog fancier and poundkeeper from the late 1870s who wanted to be a “good Samaritan,” or the family in Midvale, New Jersey, in 1906 that wanted to share the benefits of a “brickdust cure” passed down for four generations.³⁶

For secret remedies whose allure depended on their enigmatic character, revelation could easily burst the bubble of mystery. In 1846, for example, *New York Tribune* editor Horace Greeley called upon “Franklin” to reveal the hydrophobia cure that he claimed to hold in his exclusive possession if he truly wanted the public’s esteem: “Very well: out with your remedy, and let there be no humbug, no mystery about it.” The same democratic culture that regulars feared opened the floodgates of quackery thus also, in its insistence on transparency, cultivated skepticism toward dissembling and obscurantism. When “Franklin” accepted Greeley’s challenge, the shroud of secrecy fell away to reveal a rather more mundane bureaucratic reality, namely, a formula based on the jawbone of the dog, “the false tongue of a newly foaled colt,” and verdigris that the New York state legislature had published back in 1806.³⁷

Unlike this recipe from “Franklin,” the origins of most secret formulas are impossible to trace. The ultimate sources of lay remedies and preventive measures that circulated openly also frequently remain obscure. Sometimes they relied on older published sources that had since fallen out of favor. In 1844, for example, a reader from New Jersey specifically alluded to Anglican theologian John Wesley’s eighteenth-century medical guide, *Primitive Physick*, when recommending cold baths, a mixture of trefoil ashes and lard, and a brine solution as reliable treatment options for mad dog bites.³⁸ But since popular medical guides and physicians’ treatises themselves drew freely from

traditional knowledge, one cannot discount the generalized folk origins of therapies such as Wesley's.³⁹ Stories about the "old Saxon" or "Saxon forester" who had prevented hydrophobia in humans and livestock since the early nineteenth century by washing bite wounds with vinegar and then applying hydrochloric acid to destroy the dangerous poison in the animals' saliva, for example, summoned more direct images of vernacular healing traditions and their preservation through local folkways and key individuals within communities. By the 1870s, the Saxon forester had become "an aged Saxon doctor," but the prophylactic remained substantially the same.⁴⁰

In addition to everyday remedies and preventatives, along with individual readers' secret favorites, New York's news outlets also alerted readers to botanic, homeopathic, and other treatments from different medical sects. At various points from the 1840s to the 1880s, such alternatives included ads for a Thomsonian's "anti-spasmodic tincture," news of "a medicine known to Botanic Physicians as the Third Preparation" that purported to cure hydrophobia with the Thomsonian standbys of capsicum and lobelia plus a hint of myrrh, and a homeopath's report that "sulphurous acid gas dissolved in wine in repeated doses" could alleviate a wide variety of ailments, including hydrophobia. There was also a vague promise of a Thomsonian rabies cure in an ad for *Brown's Receipt Book*, and another promise from a homeopathic practitioner in Brooklyn of a salutary powder that he had employed hundreds of times without fail. Health reformers such as Sylvester Graham, memorialized today in the cracker that shares his name, or, a generation after Graham's heyday, John Harvey Kellogg, now better remembered for the eponymous cereal brand, promoted simple diets as the key to bodily well-being, and in 1870, the *Brooklyn Daily Eagle* got wind of a rumor that "Graham bread" had cured a hydrophobia case in New England.⁴¹ Vapor baths, which will be discussed in detail later in the chapter, also received considerable attention for their purported ability to restore health by aiding the body's natural capacity to sweat out deadly poisons.

Regular physicians entered this diverse world of preventatives and remedies with their own wide-ranging treatment regimens and professed cures that reflected the ever-changing content of medical therapeutics from the 1840s to the 1880s, particularly the shift from depletive to stimulative therapies, the rise of chemistry and the expanded medical usage of newly isolated or synthesized inorganic and organic compounds, and the emergence of new and promising drugs from the flows of knowledge that accompanied late-century imperialism. Although regulars' hydrophobia treatments spanned the

medical spectrum, borrowing freely from everyday remedies and unorthodox sects' preferred approaches, they drew primarily from the most powerful drug therapies available, whether chemical or biological in origin. Their ministrations to hydrophobia victims exemplified how heroic medicine did not disappear in the nineteenth century so much as shift away from blood-letting, blistering, cupping, mercury-based compounds, and other depletive measures in favor of heroic stimulative therapies as the preferred means for restoring the normal balance of the body.⁴² Occasionally, regulars resorted to traditional heroics, such as the calomel used on a hydrophobia patient at Kings County Hospital in Brooklyn in 1855 or the report in 1886 from a French medical journal of a hydrophobia case treated successfully with corrosive sublimate (a nineteenth-century term for mercury chloride) and atropine.⁴³ For the most part, however, cases from the 1840s and 1850s documented the realignment from depletive to stimulative strategies for treating rabies. In an early indication of the transition, in 1840, Lewis Feuchtwanger noted an existing split between physicians who sought "to stimulate and support the vital power" and those who viewed hydrophobia as an inflammatory condition that required "severe bleedings and exhaustion."⁴⁴ J. Lewis Smith's 1856 case report advocated brandy and beef tea—both standard stimulative medicines in the mid-nineteenth century—over the old heroic tradition. Smith observed, "Ordinarily, in cases of toxaemia, it is not the approved practice to prescribe debilitating measures; and why in hydrophobia? . . . I know no fact, no argument, in favor of such treatment—but, on the other hand, were brandy and beef tea freely administered, a large number might, perhaps, be saved."⁴⁵

The treatment of hydrophobia with opium and its derivatives underscores this new, mid-nineteenth-century commitment to heroic stimulation. Smith mentioned "opiates, anaesthetics, and purgatives" as "adjuvants," but other physicians employed them as the first line of treatment. Opium and laudanum (tincture of opium) already had well-established places in the *materia medica*, with opium dating back to antiquity and laudanum to Paracelsus in the sixteenth century, and physicians faced with hydrophobia victims reached for them readily as they tried desperately to mitigate patients' symptoms. Although used to ease pain and sedate, administration of opium was also consistent with heroic stimulation. As *Gunn's Domestic Medicine* put it, opium belonged to the category of "medicines which excite the whole system into action."⁴⁶ Hence the central place of opium and other sedatives and narcotics as attempted means of both easing symptoms and redressing bodily weak-

ness and instability in the treatment of rabies at New York Hospital in the mid-1850s, as well as in other cases in the medical literature and in news reports in the mid-nineteenth century.⁴⁷

In addition to medical theories about the restoration or maintenance of bodily equilibrium, nationalist political responses to the global trade in *materia medica* also shaped regulars' therapeutic choices. In 1856, New York physician Henry Guernsey treated poundkeeper Daniel Sullivan's hydrophobia symptoms with a broad range of "anti-spasmodic[s], stimulants, narcotics, anodynes, and counter-irritants," including, in addition to opium, a blister on the spine, tobacco on the abdomen, the application of stramonium leaves all over the patient's body, an enema of asafetida, administration of brandy and flaxseed tea, and, finally, sedation with chloroform.⁴⁸ Guernsey's use of tobacco and stramonium, more commonly known as Jamestown weed, hinted at the broader politics of American botanical resources. In an antebellum era still defined by the uncertain status of the United States in a global order, American physicians eagerly extolled the virtues of domestically grown plant remedies for both medical and political reasons. In addition to being better suited to American constitutions, native plants avoided the risks of stale and adulterated imports, and they also, as *Gunn's Domestic Medicine* emphasized, promised medical self-sufficiency that would free the United States "from individual and national *dependence* on other nations." Norwood's 1838 edition of Buchan's *Domestic Medicine* similarly stressed the virtues of American plant materials and the local substitutes that worked as well or better than cinchona and other expensive and unreliable imports that had to make detours via European middlemen and transit routes on their way from South America or Asia to the United States.⁴⁹ From this standpoint, domestically grown plants offered superior therapeutic options. Beyond its value as a key export product, tobacco's multiple medical applications included its anti-spasmodic and tonic qualities, while Jamestown weed was one of the most significant domestic anodynes. Both grew readily in the United States, and they demonstrated the power and utility of the American *materia medica*.⁵⁰

Meanwhile, as chemistry came into its own as a discipline in the nineteenth century, it generated a whole host of new, laboratory-based products for medical therapeutics through the extraction, purification, and synthesis of organic and inorganic compounds. By 1800, American medicine already rested on a diverse assortment of medicinals drawn from ancient texts, traditional European practices, and European encounters with new peoples and places in the Americas, Asia, and Africa from the seventeenth century on-

ward, including the opium, brandy, beef tea, tobacco, and Jamestown weed discussed previously.⁵¹ After the 1840s, active ingredients isolated through chemical techniques increasingly supplemented or replaced natural products and their basic extracts, and the synthesis of new compounds generated dramatic additions to the existing pharmacopeia that regular physicians looked to as means of perpetuating their claims to unique authority.

In case after case, compounds first isolated chemically in the earlier part of the century gradually entered into regular medical use. Morphine provides the paradigmatic example. Its chemical isolation in the early 1800s at first went relatively unnoticed, but hospitals began to employ it regularly in the 1830s and 1840s, and morphine was a staple in battlefield medicine during the Civil War.⁵² In the 1860s and 1870s, during an era of ever-more energetic efforts to understand the physiological dimensions of drug action, morphine featured regularly in attempts to treat hydrophobia cases.⁵³ Atropine, a chemical component of belladonna, Jamestown weed, and other nightshades, followed a similar trajectory. First available as a crude extract by 1802, it was purified in 1831, and in the late 1870s, British physicians Sydney Ringer and William Murrell began to elucidate its interactions with the human nervous system.⁵⁴ Eighteenth-century European sources had already cited belladonna as a rabies remedy, and growing familiarity with atropine's physiological effects suggested its plausibility for treating hydrophobia. By the 1880s, brief reports of atropine's purported success in curing rabies reached New York publications.⁵⁵

Liquor ammoniae fortior, a strong aqueous solution of ammonia, provides another example of the translation of traditional remedies into the language and expectations of modern chemistry. Before the chemical isolation of ammonia in the 1770s and the establishment of standard dispensatory formulas for the preparation of aqueous ammonia in the 1830s, physicians found diverse applications for spirit of hartshorn, an old medicinal that came from the distillation of shavings from deer horns and hooves, and likely derived from long-established vernacular uses of animal parts. In the early decades of the nineteenth century, spirit of hartshorn served as a stimulant, a diaphoretic, an antispasmodic, an antiseptic, and a treatment for poisonous snake, spider, and insect bites.⁵⁶ All of these qualities, especially its effectiveness against poisonous animal bites, made the nostrum attractive for the symptomatic treatment of rabies, and in 1846, the *Brooklyn Daily Eagle* cited reports that spirit of hartshorn offered a surefire hydrophobia cure.⁵⁷ Eighteenth-century sources warned against cheap substitutes and emphasized the need

to use real hartshorn, but chemistry gradually made spirit of hartshorn synonymous with aqueous ammonia in the eyes of nineteenth-century dispensaries.⁵⁸ Chemical analysis and synthesis made possible the standardized formulas of regular and strong solutions of liquor ammoniae (also known as aqua ammoniae, among other designations) that appeared in British dispensaries in the 1830s, and liquor ammoniae fortior earned medical recognition as a vesicant and counterirritant, in addition to the previously identified benefits of spirit of hartshorn.⁵⁹ Several decades later, between the 1860s and 1880s, it also enjoyed a bit of a heyday as a hydrophobia remedy, and multiple reports appeared in New York newspapers and medical journals about its ability to stave off or cure hydrophobia.⁶⁰ As much as the chemical nomenclature conveyed the growing authority of the nineteenth-century chemistry laboratory, however, liquor ammoniae fortior represented to a considerable extent a simple reworking of old medical knowledge. When a paper presented at the National Veterinary Association in 1885 suggested that the alkaline ammonia solution destroyed the hydrophobia toxin in the body, it unknowingly reproduced claims made for spirit of hartshorn nearly four decades earlier.⁶¹

Nineteenth-century chemistry also brought wholly new substances such as chloroform, chloral hydrate, potassium bromide, and amyl nitrite into medical practice. Sixteen years after the discovery of chloroform in 1831, Scottish physician James Young Simpson uncovered its anesthetic properties, and in addition to joining ether and nitrous oxide in launching a new era of anesthetic surgery, chloroform entered the medical canon as a sedative and antispasmodic. Already in the late 1840s and early 1850s, multiple accounts underscored its superiority to all other agents in relieving convulsions in tetanus, which suggested to physicians that chloroform might be equally effective in treating hydrophobia.⁶² Although Charles D. Homans's hydrophobia patient in 1854 reacted badly, other physicians described cases in which chloroform eased hydrophobia symptoms, or even achieved outright cures.⁶³ After the synthesis of potassium bromide in the late 1820s and chloral hydrate in the early 1830s, physicians discovered medical uses for both chemicals in the 1850s and 1860s, and the two drugs became ubiquitous in medical treatment during the 1870s and 1880s, during an era when new techniques and devices, such as thermometry, sphygmographs, and urinalysis, allowed more intense monitoring of physiological processes, and standardized pharmaceuticals facilitated more precise therapeutic interventions.⁶⁴ The sedative properties of chloral hydrate and the antispasmodic qualities of potassium bromide made both compounds attractive options for hydrophobia from

the 1870s to the 1890s, and physicians readily added them to treatment efforts that also continued to include morphine, chloroform, and laudanum, as well as the traditional stimulants of beef tea and brandy.⁶⁵ In the 1860s, British physicians began to explore the physiological effects of amyl nitrite, first synthesized in 1844, and subsequently introduced as a treatment for angina pectoris in 1867. Amyl nitrite briefly attracted attention in the 1870s as a potential remedy for diseases that attacked the nervous system, including hydrophobia, before its promise faded.⁶⁶

The medical and scientific enthusiasms that tied chemistry, pharmacology, and physiology together in an ever-more potent combination during the second half of the nineteenth century also joined with global imperialism to reinforce the search for medicinal possibilities, including potential hydrophobia remedies, from botanical sources worldwide. News about the ability of *Cannabis indica*, curare, hoàng-nân, jaborandi, and other plants and derivatives from Asia, Latin America, and Africa to cure hydrophobia regularly peppered the pages of New York medical journals and daily newspapers. Occasionally, these reports brought new additions to the materia medica. Jaborandi, or *Pilocarpus pennatifolius*, a shrub native to Brazil and Paraguay, populated European greenhouses by the late 1840s but had no known applications in allopathic medicine until 1874, when a physician in Brazil found that an infusion made from its leaves induced vigorous sweating and salivation. Jaborandi then moved quickly from the field to the laboratory with the isolation of the alkaloid pilocarpine in 1875, and both plant extracts of jaborandi and chemically purified pilocarpine soon entered official pharmacopeias.⁶⁷ At a time when sweating poisons from the body or removing them through intense salivation remained highly viable medical strategies, pilocarpine offered obvious possibilities for treating hydrophobia. Despite the conclusions of a committee of the Paris Academy of Medicine that pilocarpine did more harm than good in hydrophobia cases, news of cures by pilocarpine aroused a cautious sense of optimism in both the New York medical press and the city's dailies throughout the 1880s and beyond.⁶⁸

In another expression of the relationship between medicine and empire, nineteenth-century interest in *Cannabis indica* and hoàng-nân as hydrophobia cures developed in tandem with the trajectories of imperial power in India and Vietnam. Records of hemp's medicinal uses dated back to antiquity, but European interest remained minimal until the late eighteenth century, when French soldiers returning from Egypt and British physicians arriving from India apparently called attention to the possibilities of more powerful, non-

European varieties of hemp for recreation and health.⁶⁹ In 1839, a British army physician and professor of chemistry and materia medica at the Medical College of Calcutta, W. B. O'Shaughnessy, earned recognition on both sides of the Atlantic for his detailed account of *Cannabis indica*'s medicinal qualities, and he also claimed priority in using East Indian hemp to treat hydrophobia. Although the patient died, the physician reported that *Cannabis indica* greatly eased his symptoms and suffering.⁷⁰ The US pharmacopeia introduced *Cannabis indica* extract in 1851, and within a few years, during the period just before the British establishment of formal colonial rule in India, reports began to appear in New York newspapers of hashish's virtues as an antispasmodic and its potential as a hydrophobia treatment.⁷¹ By the early 1880s, scattered reports heralded *Cannabis indica* for achieving in British colonial India one of "the small number of cures that are now on record."⁷²

Hoàng-nàn similarly followed the knowledge flows of global imperialism. The new drug came to French attention when a Catholic bishop in Tonkin, Jean Denis Gauthier, learned of its reputation among locals as a treatment for rabies and leprosy. Gauthier sent a sample of powdered hoàng-nàn bark to Paris for analysis in 1874. Within a few years, as the French sought to consolidate and expand their power in Indochina, hoàng-nàn traveled along the pathways of empire via Catholic networks to Trinidad, Guadeloupe, the Danish Antilles, and Venezuela in the Caribbean, to India through the French mission in Pondicherry, and to Mesopotamia. Eager missionaries claimed the powdered bark useful for treating scrofula, ulcers, poisonous snake bites, paralysis, syphilis, epilepsy, and other maladies in addition to rabies and leprosy.⁷³ News of its therapeutic possibilities also circulated to other parts of the world, including the United States, through the medical literature. Although chemical analysis quickly identified strychnine and brucine as the active ingredients in hoàng-nàn, Lesserteur suggested that the bark exhibited specific physiological effects not entirely reducible to its individual pharmaceutical constituents, and hoàng-nàn continued to stimulate medical curiosity about its potential applications.⁷⁴ In the early 1880s, physician Henry G. Piffard of New York City's Charity Hospital developed a particularly strong interest in hoàng-nàn. He acquired a supply of the drug, possibly through correspondence with the Dominican priest Étienne Brosse, who was using hoàng-nàn in Trinidad, and Piffard proclaimed its efficacy as a leprosy treatment.⁷⁵ When it came to rabies, Gauthier asserted hoàng-nàn's infallibility as a hydrophobia preventive and its high cure rate in active cases. Although subsequent reports were more mixed and no records have emerged of attempts

to treat rabies victims in New York with *hoàng-nàn*, news about the drug as a hydrophobia treatment continued to appear in the city's medical journals during the 1880s.⁷⁶

As the history of pilocarpine, *Cannabis indica*, and *hoàng-nàn* indicates, the presence of some of the new botanical aspirants from the global *materia medica* remained more virtual than actual when it came to treating hydrophobia in New York City. New York physicians did use curare, however, which excited more sense of clinical possibility in both the medical and popular press than any other plant derivative in the 1870s and 1880s. European familiarity with curare (also known as *woorara*, *wourali*, *ourari*, *urari*, and numerous other variations) dated back to Spanish reports from the sixteenth century. Until the nineteenth century, however, Europeans knew relatively little about curare other than its obvious dangers. Interest in exploring its chemical and physiological properties spiked after Alexander von Humboldt's visit to La Esmeralda, on the Orinoco River in what is now Venezuela, where he managed to observe local indigenous peoples as they made their version of the arrow poison. Von Humboldt published a reliable and detailed account of curare's preparation in 1807, and he provided samples to various luminaries of French physiology and chemistry. Other European naturalists and explorers in Amazonia followed, and these travelers obtained information both accurate and inaccurate, established supply lines, and functioned as intermediaries in the knowledge flow between Native peoples and European scientific and medical elites.⁷⁷

The chemistry and physiological effects of curare proved difficult to determine well into the late twentieth century, since the poison's composition varies widely among indigenous peoples who, depending on their local geography, use plants from any one of three different genera for the paralyzing agent. Jean-Baptiste Boussingault managed a crude extract in the 1820s, but isolation of the different active ingredients and determination of their chemical formulas remained elusive until German pharmacologist Rudolf Boehm began to characterize some of the curare alkaloids in the 1880s. Nonetheless, physiological exploration of curare's effects began earlier, despite the lack of standardized research materials and dosages, and in 1850, the French experimental physiologist Claude Bernard published pathbreaking studies of the effects of curare on nerves and muscles in frogs.⁷⁸

In the context of early nineteenth-century exploration and midcentury physiological research, physicians anticipated that curare's paralytic effects might counter and control extreme spasms and convulsions in diseases such

as tetanus, epilepsy, and hydrophobia, to the point of curing patients. The idea remained largely speculative for decades, except for English veterinary surgeon William Sewell's attempt to use curare to treat equine tetanus in 1838. Then in 1858, several years after the publication of Bernard's physiological findings and amid the new era of a rapidly expanding array of novel therapeutics, surgeon L. A. Sayre tried curare for the first time on a human tetanus patient at Bellevue Hospital in New York City. Although the patient died, physicians on both sides of the Atlantic continued to experiment with curare in cases of tetanus, epilepsy, chorea, and other conditions in the 1860s and 1870s.⁷⁹ In the midst of these therapeutic explorations, curare came into vogue as a rabies treatment, especially after German reports reached the United States in 1876 about a young woman cured of hydrophobia through curare injections.⁸⁰ By 1880, Roberts Bartholow, professor of materia medica and therapeutics at Jefferson Medical College in Philadelphia and author of a well-known reference guide to materia medica, endorsed curare in an address before the Alumni Association of the College of Physicians and Surgeons in New York. Curare, he said, "is the only remedy which has apparently exerted a curative influence on hydrophobia," and "two well-authenticated cases" of recovery demonstrated its power.⁸¹ New York sources subsequently reported attempts to treat hydrophobia victims with curare or one of its chemical components, curarine, on multiple occasions in New York and the surrounding area during the 1870s and 1880s, and by 1887 curare was common enough that the *New York Herald* described it as part of "the ordinary treatment" for hydrophobia.⁸² As late as 1919, general discussions of curare cited its occasional successes in treating tetanus, hydrophobia, and epilepsy, even if "it cannot be relied upon."⁸³

As the foregoing account indicates, regular physicians' recommended hydrophobia remedies between the 1840s and 1880s emerged from a complicated and rapidly shifting therapeutic environment. Traditional standards from the materia medica with roots in folklore and in constitutional theories about the restoration and maintenance of health meshed with a new age of chemistry, pharmacology, and therapeutics, in which recently isolated or entirely novel compounds entered clinical practice across the middle decades of the nineteenth century. During this time period, chemistry, experimental physiology, and empire also formed a potent combination that generated a seemingly endless array of new additions to pharmacopeias and medical practice. As New York physicians reached for options on the rare occasions that they encountered human rabies cases, they drew from an enlarged ar-

mamentarium during a transformative period in the history of medical therapeutics. Yet the distinctiveness of allopathic medical authority remained questionable amid the uneasy accommodation between lay knowledge and medical expertise, along with the persistent sectarianism, that structured choices and healing practices within the democratic political culture of nineteenth-century America.

Of Mysteries and Madstones

Although regular physicians generally agreed on the value of sedatives and antispasmodics for treating hydrophobia, and they believed in the occasional therapeutic triumph, no single remedy earned universal acclaim, and the allopathic dispensatory remained just one among multiple possibilities. Among the plethora of recommended rabies preventives and remedies, madstones and vapor baths stood out for the strength of their constituencies and the frequency with which animal bite victims resorted to them. Madstones were the nineteenth-century American variant of the snake stones, bezoars, tabasheer, and other animal-based or stonelike objects purported to have powerful medical qualities according to different healing traditions across time and around the world, and their persistence suggests both the strength of vernacular medicine as well as the challenges they raised about belief and credulity in a democratic society during the second half of the nineteenth century.⁸⁴

Madstones were usually small objects—perhaps a couple inches long and an inch wide at most—and varied in appearance and composition. Believers in their efficacy debated over whether they were animal or mineral in origin. But whether “porous” and like “a piece of lava,” derived from animal bone, found in the organs of deer or other ruminants, or possessing “the appearance of any ordinary black pebble,” all madstones worked according to roughly the same theory and formula.⁸⁵ In the usual procedure, the madstone would be soaked in warm milk and then applied to the wound. If it stuck, that signaled the presence of poisons in the body, which the stone would remove. It might adhere for several hours, or even a couple of days. When it fell off, it was soaked in milk again, and the appearance of green scum demonstrated the presence of the toxins that the madstone had successfully cleared from the body. The origins and development of this regimen—for example, whether descended from early modern European traditions that themselves had roots as far back as antiquity, or from Native American medical practices—remain unknown. The high degree of standardization, however, which included only minor variations in practice, suggests a well-established body of vernacular

knowledge at work among the medical and lay practitioners in the South, parts of the Midwest, plus Oklahoma and Texas, whose endeavors spread the word of madstones' fantastic properties.⁸⁶

News stories reveal the complex social and cultural networks that surrounded these medical oddities. Owners and communities of users considered them rare and valuable objects, particularly those individual madstones with sufficient provenance and standing to attract patients from dozens or even hundreds of miles away.⁸⁷ Names—the Mascot in Kansas City, the Fauquier madstone of Fauquier County, Virginia, the MacNeill and Pointer stones of Georgia, the William Phipps madstone of Columbus, Ohio—also suggested the renown of particular madstones for their ability to prevent hydrophobia. The Mascot, for example, had reportedly achieved hundreds of successes and only one failure, when the victim was already in convulsions by the time he arrived for treatment.⁸⁸ During a rabies outbreak in 1886 in Pope County, Arkansas, area residents expressed their preference for a nearby madstone over Pasteur's recently developed procedure for rabies vaccination.⁸⁹ Practical contingencies helped to sustain the madstone's esteem, since Pasteurian rabies vaccination remained out of reach for countless animal bite victims in the South and the heartland. As will be discussed in detail in chapter 5, after 1885, New Yorkers who could bear the expense of overseas travel could seek highly effective vaccination in Paris from Pasteur, and after 1890, preventive hydrophobia treatment became available in New York City. Too many other people, however, could not afford distant travel, not to mention the two to three weeks away from home while undergoing the injections necessary to build immunity. Even locally, when the New York Pasteur Institute agreed in 1891 to provide free treatment for several poor children from Newark, their parents faced a major hurdle in sparing the time and money for travel into the city as well as childcare for their other offspring. For people much further afield, vernacular reputation sometimes made the madstone a more viable option.⁹⁰

The reasons for madstones' regional confinement to the South and the heartland remain unclear. In the areas where their usage flourished, however, faith in their power rested on lore that tied the stones to venerable lineages, whether from a distant European past, the exoticism of Asia, the secret healing practices of enslaved African Americans in the South, or the ancient customs of Native Americans. For example, J. P. Evans of Lincoln, Illinois, who possessed a madstone that had failed only once in more than a thousand cases, said that his great-grandfather had brought the stone from Wales to

Virginia, while the Mascot's owner reported his stone's origins in Ireland more than 170 years earlier. The Fauquier madstone, farmer Uriel Triplett's prized family heirloom, supposedly originated in China and had been in his wife's family for more than two centuries.⁹¹ Other madstones claimed origins closer to home, in which stories that associated them with the hidden wisdom of American Indians or southern slaves added to their legitimacy as healing objects.⁹² Euro-American professions of indigenous cultural inferiority persisted side by side with the established image of the "Indian doctor" and ready employment of Native American remedies in nineteenth-century America. Similarly, in the plantation south, slaveholders dismissed black healing practices almost by reflex, yet they relied on black root doctors and conjurers when it suited them.⁹³ In this Americanized version of orientalism, allegedly uncivilized peoples possessed an innate closeness to nature that simultaneously provided access to ancient and mysterious forms of knowledge, while also signifying their racial inferiority.⁹⁴

As objects that combined lore and power, madstones with strong reputations could also be highly lucrative. Although some owners refused to take payment for providing treatments, charges of \$5 or \$10 were not uncommon. A Mrs. Taylor, who owned a stone in Terre Haute, Indiana, asked for \$15 to cover both application and board.⁹⁵ With such financial stakes attached to their rare social status, madstones sometimes gained significant monetary value. In 1898, a particularly well-regarded madstone in Leesburg, Virginia, went on the auction block after an inheritance suit led to its forced sale. The stone boasted a record of 130 cures and a prominent lineage, with its reported arrival in the United States from Scotland in 1776, as well as claims of its mention in Sir Walter Scott's 1825 novel, *The Talisman*, which was set during the Crusades. A local physician ultimately paid \$682.50 for the prize, a lavish sum at a time when an average physician's annual earnings might not greatly exceed \$1,000.⁹⁶

In New York City, madstones existed only as a virtual presence in the pages of newspapers, and not as a remedy in medical practice, yet they established a noteworthy niche in the popular medical imagination. Among unorthodox hydrophobia remedies, only vapor baths attracted more attention from the press. The range of commentary that appeared in New York papers, with its mixture of straightforward reportage about madstones' characteristics and elaborate testimonials about their achievements, capsule accounts of success or failure, tongue-in-cheek stories about the stones as medical curiosities, and outright dismissals and debunkings, speaks to the culture of

credulity and humbug that surrounded science, medicine, and American society in the nineteenth century.

A veritable craze for natural history defined the public character of American science from the middle decades of the nineteenth century onward, and New York City possessed a rich array of institutions dedicated to the collection and display of natural objects. In the 1840s, Barnum's famed American Museum, the anatomical museum of the Eclectic physician Wooster Beach, and other institutions displayed all manner of strange marvels of nature and of the human body that primed viewers to contemplate the mysterious, wondrous, bizarre, and even grotesque possibilities of the natural world in a way that was both spine-tingling and awe-inspiring. Popular anatomy continued to fascinate and titillate New York audiences well into the 1880s and beyond, in a period when the city boasted a range of anatomical museums with both highbrow and lowbrow pretensions. Some of these institutions vied for intellectual respectability, but the enforcers of public decency did not always differentiate them from their more sensationalist counterparts. A police raid on Kahn's Museum in 1888, for example, forced the removal of the museum from Broadway to the Bowery, despite the protestations of William A. Hammond and other elite New York physicians.⁹⁷

Beyond human anatomy, other aspects of the natural world also beckoned to popular audiences and posed difficult conundrums about how to separate education and uplift from diversion and spectacle. In 1869, the American Museum of Natural History (AMNH) opened its doors in Central Park's Arsenal before moving to its imposing quarters on 77th Street eight years later. Along with the park itself, the new museum represented the mission of New York elites to promote culture and refinement. The representation of nature, however, did not lend itself easily to the hierarchical distinction between enlightened truth and lowbrow entertainment. For example, in the early twentieth century the AMNH began to awe visitors with its lavish dioramas of birds, mammals, dinosaurs, and peoples that, as Lukas Rieppel has shown, amounted to displays of imagination and ideology as much as accounts of indisputable fact.⁹⁸

Popular natural history and the line between fact and fancy raised central questions and challenges during a nineteenth-century era in which aspirations for a democratic political culture melded with concerns about urbanization, the navigation of everyday life in a crowded world of strangers, and the jarring mixture of opportunity and fraud that accompanied the dizzying new possibilities of the market in an expanding national economy. This com-

bination of circumstances raised anxieties about the need for Americans to cultivate keen powers of observation and judgment in order to ward off dangerous credulity in a world rife with confidence men and their deceptions.⁹⁹ But nature simultaneously remained a source of mystery and strange possibility, which is precisely why natural objects and phenomena that flirted with the borderline between reality and imagination held so much allure in the nineteenth century. The same New York medical journal that railed against quackery in 1845, for example, could also report in all seriousness on a case of spontaneous combustion in a living human being six years later.¹⁰⁰ Other bizarre medical phenomena, such as “a parasitic foetus” mentioned by the *Medical Record* in 1890, echoed the tradition of monsters and other strange objects found in early modern natural history cabinets.¹⁰¹ Nor did the growing separation between expert authority and lay communities by the end of the century and experts’ efforts to assert their status as the arbiters of legitimate knowledge settle matters. For example, the paleontologists described by Rieppel struggled to find a balance between appealing to public audiences in search of strangeness and wonder, and reining in their own highly speculative impulses, as they assembled skeletons and elaborate dioramas at the AMNH that purported to illustrate dinosaur morphology and ecology.¹⁰²

The madstone narratives in New York newspapers need to be understood within this context of a democratic culture that allowed and required individuals to determine truth for themselves, and an urban world in which perceptions of the constant threat to trusting newcomers of deceit and trickery at the hands of confidence men posed a stark contrast to the midcentury Victorian cult of sincerity. In this setting, institutions such as Barnum’s American Museum, with its displays of the Feejee Mermaid and other fantastic objects, or news of hoaxes, such as the Cardiff giant unearthed in upstate New York in 1869, performed a valuable service by forcing city residents to confront the limits of trust, hone their senses, and test their ability to distinguish between truth and bunk.¹⁰³

As natural objects purported to have marvelous healing powers, madstones offered yet another occasion among myriad opportunities for New Yorkers to deliberate over possibility and its limits. Simple capsule summaries that testified to success and failure—“a successful application of the mad stone in a case of hydrophobia” in Illinois or the death of an Illinois tollgate-keeper after “the ‘mad stone’ was tried without avail”—invited belief and skepticism.¹⁰⁴ A brief report of a child’s death from hydrophobia in Louisville, Kentucky, in 1862, with the notation that “instead of calling in a physician, his

parents relied upon the famous ‘mad stone,’” suggested the dangers of credulity.¹⁰⁵ Other accounts of deaths that followed both prompt cauterization and treatment by madstone, however, also underscored how even the one prophylactic action backed by an established consensus offered no guarantees, and all additional measures, whether allopathic or unorthodox, became both equally plausible and equally outlandish in the face of hydrophobia’s unrelenting deadline.¹⁰⁶

Rather than leave the public to its own guidance, newspaper editors and readers sometimes took it upon themselves to caution forthrightly against the sham of the madstone. Stories from the 1870s about a manufacturer in Virginia that used animal bone and chemical processes to mass-produce madstones for sale for \$5 apiece, or an unsolicited postcard from an Illinois resident to a physician at Long Island College Hospital with the generous offer to sell a madstone for a staggering \$30,000, suggested the hijinks at work in an age of schemers.¹⁰⁷ Physicians wrote in to insist upon the need for medical reasoning as a bulwark against credulousness. In July 1854, for example, after the *New York Tribune* described cases in Virginia of successful treatments of rabid dog bites with madstones, an Ohio physician expressed his strenuous objections. Hydrophobia, he emphasized, was “essentially incurable,” and if allegedly favorable outcomes happened, it was because “nine-tenths of the cases of bites supposed to be rabid result in no serious injury simply because the dogs were not mad.” Only thorough and immediate chemical cleaning of the wound, followed by cauterization with a red-hot iron, offered any utility in preventing hydrophobia. To this course of action, the *Tribune* added its own editorial endorsement: “We are inclined to think the Doctor is pretty near the truth.”¹⁰⁸ In a similar vein, in 1870 a Baltimore professor decried recent news about the Fauquier madstone and lamented, “The evil resulting from belief in remedies so absurd is that it prevents the use of efficient means.”¹⁰⁹ That same year, the *New York Times* also took care to reprint a report from Missouri that warned that a failed madstone treatment “tends to show that the virtues of the ‘mad-stone,’ in which so many believe, furnish but a poor guarantee of a cure, and if it helps to explode the humbug and lead people to resort to the only safe measures, cutting out the part and severe cauterization, it will not have been entirely barren of fruits.”¹¹⁰ In the mid-1880s, in response to a reported cure in Virginia, the *Times* again editorialized against gullibility about madstones: “The alleged cures wrought by the madstone can be easily explained. Probably three-fourths of the dogs that are alleged to be suffering from rabies are really suffering from distemper mad-

ness, and their bite is harmless. Furthermore, at least one-half of the wounds inflicted by really rabid dogs do not cause hydrophobia.”¹¹¹ In such instances, impressionable people incorrectly credited the madstone for their continued health, rather than plain old good luck.

In 1899, the *Tribune* reprinted an account from Louisiana that detailed the workings of the madstone as a kind of confidence game that bamboozled the unwary. A “newspaper man” recollected in the *New Orleans Times-Democrat* that he had witnessed the application of a madstone near Roanoke, Virginia, back in 1892, and he used the recent occasion of the auctioned madstone in Leesburg to expose the ruse at work. In a narrative that contrasted urban sophistication with rural naiveté, he observed that the madstone seemed like no more than “everyday marble,” and it “adhered on exactly the same principle as the leather ‘suckers’ made by schoolboys, but the spectacle was hailed as a miracle by the simple-minded rustics” who took part in the procedure. “The solemn farce,” he continued, “was repeated with each of five people,” all of whom believed firmly that the madstone had saved their lives. For the urbane, hard-boiled New Orleans reporter, however, the would-be patients were mere marks who had been hoodwinked: “As far as I could learn none afterward had hydrophobia, but there was absolutely no evidence that the dog was mad, and as it was foolishly killed nobody could be certain. The patients were charged \$5 apiece and I was told that the old man made a tidy thing out of his practice.”¹¹² This parable of humbug served to warn readers to maintain their guard, lest they be conned and snookered.

Yet, despite such skeptical commentary, New York newspapers never entirely dismissed the wondrous possibility of madstones. Fantastic tales undiluted by negative comment, such as the reported cure of a Kentucky girl in 1872, who reached such an advanced state of illness that “her eyes . . . were of a dark green, and of that strange expression which is peculiar to animals [in] a state of hydrophobia” before the madstone achieved medical “victory,” served to entertain and amaze.¹¹³ Medical testimonies of success, such as the Charleston, South Carolina, physician in 1884 who reported a case where a cow bitten by a mad dog died but the woman whose bite he treated with his madstone lived, undermined the admonishments of other medical practitioners.¹¹⁴ The dailies sometimes walked a fine line between scoffing and validating. When the *Times* reported on the Fauquier madstone in 1871, for example, the story started off with a discourse on the present age as one of gullibility: “There may be limits to human credulity, but we do not often get a glimpse of them . . . belief in things absurd, and, as matters of physical sci-

ence, impossible, was never in the world's history more prevalent than now." The Fauquier madstone provided just the latest example of such "widespread credulity." The article went on, however, to describe in lavish detail Uriel Triplett's account of his family's madstone, and it cited the "reputable persons" whose "weight of testimony" suggested the validity of Triplett's stories. Although the *Times* backed away from an endorsement, its wishy-washy conclusion—that "the story of the 'Fauquier Mad-stone' certainly opens the door to a fresh field of conjecture, wherein the part played by the imagination may be newly analyzed, and, perhaps, more fully explained"—left a far more agnostic impression than the opening declaration about flimflam and self-deception.¹¹⁵

Such equivocation should not surprise, since what made madstones worthy of attention in the first place was their strange and wondrous properties in a nineteenth-century society attuned to appreciate a thin borderline between extraordinary possibility and complete hokum. Moreover, daily newspapers, like museums and other nineteenth-century American cultural institutions, set out simultaneously to entertain and inform, so their pages always had room for odd curiosities that spoke of the liminality between nature and artifice. For city dwellers, urban life continually offered new sensory experiences with discoveries and technological innovations that seemingly generated reality from impossibility on a regular basis. Telegraphy, rail transport, telephony, photography and film, steam power, electric lighting, wireless, and automobiles radically transformed urban geography, the economy, and daily life between the 1840s and the end of the nineteenth century. In medicine, new technologies such as the stethoscope and microscope provided ever-deeper penetration into the mysteries of the human body, anesthesia and antiseptics transformed surgical possibility, thermometers and graphical devices offered new means of contemplating bodily functions, and germ theory revealed a hidden living world that suggested to some observers the existence of a whole new level of reality. As the president of the New York chapter of a homeopathic medical fraternity pointed out in 1904, as he highlighted the efficacy of homeopathic remedies for treating hydrophobia and other diseases, "Hosts of people scoff at our new-fangled notions, but they forget we are living in an age of radium and wireless telegraphy, when nothing is too extraordinary to be true."¹¹⁶ It is no wonder Americans found it difficult to distinguish between reality and fakery in the nineteenth-century city. Madstones offered just one among countless possibilities for testing one's

savvy in a world that combined the constant generation of new marvels with urban anomie and its dangers.

Vapor Baths, the Politics of Animal Welfare, and the American Career of M. Buisson

Generally dismissed by regular physicians as flimflam and quackery, madstones adhered predominantly to the realm of the vernacular and the popular. Vapor baths, by contrast, earned supporters from across the medical spectrum and the broader public, so much so that when news spread that an otherwise obscure Paris physician named Frédéric Buisson had used a high-temperature Russian bath to cure a hydrophobia patient, his methods, along with near-mythic retellings of his discovery, persisted for decades. Constitutionalism and its respect for diaphoretic strategies to remove wastes and poisons from the body, the popular vogue of hydropathy, and, by the 1890s, an alliance between medical critics of Pasteurian rabies vaccination and animal welfare advocates combined to turn Buisson treatment into a going concern in the United States throughout the second half of the nineteenth century.

In July 1837, the *New York Herald* translated a brief French report about a physician in Paris who, following the onset of hydrophobia symptoms after suffering a bite from a small dog, took to the vapor bath with the intention of seeking a high-temperature suicide rather than face an agonizing death from rabies. To the physician's surprise, he recovered completely, and subsequent efforts by other medical practitioners suggested a new hydrophobia cure. This story reappeared more than a decade later, when a Mrs. Carroll of 354 Broadway, who apparently ran a medicinal vapor bath facility, informed both the *New York Tribune* and the *Herald* about her recollections of an old report about a French physician's dramatic hydrophobia cure by vapor bath that she hoped "medical gentlemen" would identify. For her part, Mrs. Carroll promised to stand "ready at any moment to supply a Vapor Bath, with a proper person to administer it *gratuitously*" should an appropriate test case emerge.¹¹⁷ Thus did the saga of Buisson treatment make its way to New York City.

By the time New York newspapers published Mrs. Carroll's letter, Buisson's own story was more than twenty years old. In 1825, he submitted a brief treatise to the Royal Academy of Medicine in which he announced his "specific for hydrophobia," a discovery that he modestly compared in importance to Jenner's technique for smallpox vaccination. A 36-year-old male whom he identified as "M. [Monsieur] F." had developed hydrophobia after assisting in

the treatment of a woman who died of the horrific disease. F. had carelessly taken a handkerchief used to wipe the saliva of the patient and wrapped it around his hand while dealing with an episode of extreme paroxysms. F. feared exposure to rabies through a scratch on his hand, and despite cauterization, he began to develop hydrophobia symptoms on the ninth day after exposure. In response, Buisson suggested a strong vapor bath in the hopes of expelling the rabific poison from the ailing man's body, to which F. bravely replied, "Either I will be cured, or I will suffocate."¹¹⁸ Then, as the bath heated, F.'s symptoms gradually improved before disappearing entirely when the temperature reached its apex. Elated by the remarkable recovery, Buisson exultantly publicized his methods "for the good of humanity" and guaranteed their success in future hydrophobia cases.¹¹⁹

To Buisson's disappointment, the French medical establishment quickly dismissed his findings. This rejection took place at a time of extraordinary political upheaval and intense institutional competition for control over medical authority in France during the decades from the Revolution to the Bourbon Restoration. The Royal Academy of Medicine, established in 1820, emerged with generalized authority over medicine in France, including the power to legitimate claims over new therapeutics.¹²⁰ In response to a standard request from the Ministry of the Interior for an evaluation of Buisson's claims, a commission from the academy raised numerous objections, including the unlikelihood of human-to-human transmission, the high probability that cauterization of the finger scratch had prevented any virus of hydrophobia from endangering F. even if exposure had occurred, an unreasonably short incubation period that suggested fright rather than true hydrophobia, and the implausibility of the immediate disappearance of symptoms that Buisson thought he had observed. Buisson's alleged discovery, the commission concluded sternly, "is in no way worthy of attention," and some members of the academy regretted not going further and citing "the habits of a charlatan" that they detected in Buisson's boosterism.¹²¹

An indignant Buisson issued a heated response that attempted to rebut the academy's analysis point by point.¹²² When met with a stony silence, he issued a "special notice" in which he mobilized every rhetorical tactic of the age to raise the specter of arbitrary, reactionary, and conspiratorial power arrayed against truth and science. Whereas the Chamber of Deputies, the king of Bavaria, and countless foreign dignitaries, Buisson claimed, had congratulated him on his discovery, both the Academy of Medicine and the Academy of Science "are lagging behind!" For that, Buisson warned darkly, "They can

expect not only their just reproaches, but their destruction in the minds of enlightened men.” Meanwhile, Buisson nobly held himself apart from the cabals of organized scientific and medical authority, declared the righteous independence of his position, and called upon legislators to spread the word about the academies’ dangerous machinations. To the people themselves, Buisson spoke directly: “People of France, beware of these men who cry out in the assemblies—they are like dogs that bark when hungry! Beware also of those who flatter you—they resemble those same animals that stand on their hind legs to receive a bone!” In conclusion, Buisson called for virtuous institutions to survive and corrupt bodies to perish: “Let live those Academies that act without partisanship; let live those where one enters without intrigue; death to those which are otherwise!”¹²³

Had Buisson’s allegations gained traction, his critique might have sparked a broader assault against the Academy of Medicine’s still-novel authority over the medical enterprise under the delicate political conditions of France in the late 1820s. At the very least, he spoke in the era’s idiom of heated debate and political protest against the abuses of officialdom, even as he joined the ranks of countless would-be medical innovators who sought formal recognition only to find themselves ignored or ridiculed. Undaunted, Buisson apparently tried to interest the academy in his findings again in 1834, and when that failed, he published a second edition of his report in 1836. He proclaimed that even though the gatekeepers of medical legitimacy had refused to spread word of his hydrophobia cure, public demand had exhausted supplies of the original publication and necessitated the new edition. His journey, Buisson declared, had been an arduous one: “In the seven years since I found the means for curing hydrophobia, one cannot imagine the trials I have endured!!!” (Apparently, the hyperbolic use of multiple exclamation points to connote intolerable suffering in the face of profound injustice long predated the internet age. One imagines that were he writing two centuries later, Buisson would have started a blog.) After this declaration of dogged persistence in the face of naysaying authority figures, Buisson then dramatically revealed the true story of the mysterious M. F.: “This person . . . it is I!” Buisson explained that he had obscured his identity earlier in case the hydrophobia symptoms returned and he succumbed, but now sufficient time had passed for him to feel completely confident about the cure. The new version of his travails also now told of his expectations of a certain and grueling death and his search for “the quickest and least painful” alternative. He decided on a vapor bath, entered thermometer in hand, and at 42 degrees on the Réaumur

scale (equivalent to 52.5 °C), “I was cured!” According to Buisson, famed French anatomist Guillaume Dupuytren once called his method “very rational” and stated that “if he were bitten by a rabid animal, he would not hesitate to use it!!!” With those bona fides in place, Buisson then outlined his recommended procedures. For prevention of hydrophobia, he counseled a sequence of seven vapor baths, with the preferred temperature dependent on the patient’s constitution and level of perspiration, combined with having the patient sleep between two feather beds, drink copious amounts of a hot borage infusion, exercise frequently, and eat regularly according to his or her usual habits. In cases of active disease, the patient needed to stay in the vapor bath until cured.¹²⁴

Buisson does not appear to have actively cultivated an American audience, but this second version of his story began to circulate in the mid-nineteenth century through intermediaries, such as Mrs. Carroll and her 1848 letter to the *Tribune*. Elements of Buisson’s discovery narrative subsequently reappeared in New York newspapers on a semiregular basis throughout the 1850s, 1860s, and 1870s.¹²⁵ Buisson’s death in 1867 apparently escaped the notice of the New York daily press, which continued to report on Buisson treatment as if it were a recent discovery. “A Paris physician recommends seven vapor baths as a remedy for hydrophobia,” read a typical single-sentence account in 1869.¹²⁶ Nor did the medical journals do any better. As the *Medical Record* noted in 1870, “Dr. Buisson recommends one of the most simple remedies” for hydrophobia, namely, a sequence of daily steam baths for a week. The report concluded, “He says he cured himself by these means, and more than eighty persons besides.”¹²⁷ Nearly two decades later, in 1887, Buisson still merited the present tense in the *Brooklyn Daily Eagle*, and in the late 1890s, newspapers continued to talk of how Buisson “has recently caused general discussion” with his proposed regimen.¹²⁸ The *Medical Record* also headlined a brief account of Buisson treatment in 1897 with the announcement, “New Treatment for Rabies.”¹²⁹ Buisson’s cure remained perpetually in the present, even thirty years after his death.

Some local physicians put Buisson’s principles into practice. In the 1870s, a Dr. M. Hermance of Brooklyn informed the *Eagle* of his twenty-five years of medical experience with the administration of vapor baths for the removal of all manner of blood poisons, and he announced he had used Buisson’s method, along with “relaxing nervines,” to save a boy who was already symptomatic from “the terrible agonizing death of hydrophobia.”¹³⁰ Hermance’s medical allegiances are unknown, but he had the support of a hydropathic

physician in Brooklyn named Charles H. Shepard, who subsequently cited Hermance's "skillful management" in the aforementioned case, as well as his own success in 1874, when he used Turkish baths to prevent a man from developing hydrophobia following a rabid dog bite.¹³¹ Several years later, amid the months of hubbub that followed Pasteur's October 1885 announcement of a preventive vaccination procedure for hydrophobia, a Catholic priest in nearby Arlington, New Jersey, reported that he had managed to use a vapor bath to cure a boy with active symptoms that developed three weeks after a bite from a suspicious dog.¹³² Meanwhile, Shepard continued for years to advocate and use vapor baths for dangerous dog bites, and by 1899 he openly advertised the availability of the practice at his hydropathic establishment. In the early twentieth century, Shepard was still telling audiences and writing to the newspapers about the health properties of Turkish baths, including their ability to cure hydrophobia.¹³³ Meanwhile, specifically named Buisson Institutes also offered vapor baths for medical purposes in scattered locations around the world, including in the United States.¹³⁴

These and other reports, of both cures and failures, testify to the ubiquity of vapor baths as a rabies remedy in the New York City area and elsewhere in the United States from the 1840s to the 1890s. Three distinct circumstances—the popularity of water cure, allopathic faith in the virtues of diaphoresis, and the politics of animal welfare advocacy—sustained the reputation of this decades-long practice. Hydropathy became a popular and widespread therapeutic option in exactly the same era as the heyday of vapor baths for the treatment of hydrophobia. Healing practices based on water dated back to antiquity, but hydropathy as a formalized set of doctrines and institutions emerged in the mid-1820s, when Vincent Priessnitz opened a dedicated facility in Gräfenberg, Austria, that attracted an elite, mainly European clientele, but with a smattering of Americans and other nationals. Medical sectarians who wanted to avoid what they saw as poisonous drug regimens looked favorably upon the healing properties of water, and in the 1840s, American advocates of Priessnitz's methods opened their own facilities. New York City quickly became a dominant center. By the early 1850s, hydropathy in New York City possessed a full-blown organizational structure, with the founding of societies for practitioners, the publication of the movement's lead journal, and the opening of hydropathic medical schools. Water cure's message of healthy living and natural healing easily attracted adherents. In the 1850s, the New York City-based *Water-Cure Journal* boasted a circulation of more than 100,000, and during the second half of the nineteenth century, more than two

hundred water-cure establishments opened their doors nationwide, particularly in the hydropathic stronghold of the northeast.¹³⁵

The water cure relied primarily on the virtues of cold water treatments in combination with a proper routine of fresh air, diet, exercise, and other healthy habits, but also encompassed Turkish baths, Russian baths, and other types of hot water therapy.¹³⁶ Hence when word arrived of Buisson's purported hydrophobia cure, his ideas fit easily with established practices, beliefs, and available facilities. Buisson treatment or generalized use of vapor baths to treat hydrophobia also made sense from an allopathic medical perspective. Although regular physicians in the United States generally relied on sedatives, narcotics, and antispasmodics to treat rabies, water-based therapies remained a legitimate and valued option for the restoration and maintenance of health for a wide variety of conditions. Regular physicians disdained water-cure establishments, but they objected less to the use of water itself as a therapeutic agent than to hydropaths' competing claims of specialized expertise. Domestic medical guides already stressed the benefits of bathing, particularly with cold water, as well as the importance of diet, exercise, proper clothing, good sleep habits, the containment of the passions, and other typical components of water cure, and regulars strenuously objected to any efforts to usurp their authority.¹³⁷ As the *New York Journal of Medicine* observed indignantly in 1846, in a review of a book on hydropathy, "The idea that water can only be properly used at a hydropathic establishment is absurd. It may, and probably will, be employed more advantageously at home."¹³⁸ As another review six months later explained, whereas physicians could gauge the proper therapeutic uses of water at different temperatures and administered through various techniques, such as baths or douches, hydropathy was "little better than arrant quackery."¹³⁹ Such objections again alluded to the interplay between democratic culture and medical authority, in which accusations of quackery signaled a call both to boost regular physicians' authority and to develop discerning judgment in laypersons.

Decades later, allopaths continued to attack water-cure establishments as fraudulent purveyors of panaceas. They also warned of ear infections and other dangers of inexpertly administered hot water therapies, which implied that only a skilled physician possessed the judgment and experience to recommend water-based treatments in other-than-routine cases.¹⁴⁰ At the same time, regular physicians still viewed vapor baths as a valuable diaphoretic that could aid in removing toxins from the body, and over the years, physicians in New York City read about or themselves recommended vapor baths for treat-

ing a range of ailments, particularly Bright's disease and other kidney problems, as well as yellow fever, cerebrospinal meningitis, rheumatism, obesity, and gonorrhea, among other conditions.¹⁴¹

Few regular physicians openly endorsed vapor baths as a rabies cure, and most undoubtedly shared J. Lewis Smith's conclusion in 1856 that Buisson's supposed recovery meant he merely suffered from fright-induced hydrophobia.¹⁴² Yet Buisson treatment remained within the realm of orthodox possibility in New York medical circles. During a discussion of hydrophobia at a meeting of the New York County Medical Society in May 1874, for example, one physician commented on the power of Buisson treatment to cure the disease. At the very least, in otherwise hopeless cases regular physicians thought vapor baths would do no harm, even if they ultimately did no good. Hence in 1899, when steamboat captain George Bockhaven, already symptomatic, arrived too late at the New York Pasteur Institute (NYPI) to undertake vaccination, physician Paul Gibier (whose introduction of Pasteurian rabies vaccination to New York City is detailed in chapter 5) referred him to a nearby Russian bath for a last-ditch effort at Buisson treatment. As the *New York Times* reported, "Dr. Gibier had no faith in the treatment, but he saw in it the only gleam of hope for the patient."¹⁴³ Several months later, the NYPI passed on another symptomatic case, and a 7-year-old boy named Charles O. Young died from rabies despite a desperate effort at applying vapor baths during his final hours.¹⁴⁴ From an allopathic standpoint, however, the theory behind vapor baths remained sound, even if both the Bockhaven and Young cases ended in fatality. As the *Brooklyn Daily Eagle* commented wistfully after Bockhaven's death, "But is it futile to act on the supposition that a blood poison, such as that of lockjaw and rabies, cannot be expelled save by inoculation? . . . Is it impossible that an active life, like that of a sailor, a farmer, a laborer, which induces copious perspiration, should work a cure? The pores of the skin are canals devised for the express purpose of carrying off impurities, and whether sweating is induced by labor, or by sultry weather, or by that intensification of sultriness that is called the Russian bath, or by that exceeding torridity, the Turkish bath it is probably of little consequence, so that the poisons and impurities are expelled. It could do no harm, and might save life."¹⁴⁵

The emergence of organized animal welfare advocacy in parallel with the rise of laboratory medicine, however, complicated allopaths' attitude toward Buisson treatment and the potential usefulness of diaphoretic strategies. In 1866, Henry Bergh, the previously aimless son of a wealthy shipbuilder, finally discovered his life's calling when, at the age of 50, he founded the American

Society for the Prevention of Cruelty to Animals (ASPCA), which signaled the beginning of organized animal welfare advocacy in the United States. The association emerged within a social milieu of urban reformism that began to array itself against machine government in the 1850s, and many of the most prominent animal welfare advocates also pushed for temperance, the welfare of children, and other causes that reflected their concerns with the moral degradation of the city. New York, Boston, and Philadelphia quickly became centers of organized animal protection efforts, and nearly every major US city had an SPCA chapter by the 1890s. By the turn of the century, a thriving animal welfare movement operated both nationally and internationally, through a wide range of SPCAs, humane societies, and other groups that promoted new attitudes, legal protections, and institutional arrangements on behalf of animals.¹⁴⁶

In New York City, most of the ASPCA's efforts focused on the privations of animals in the day-to-day life of human society on city streets and in markets, stockyards, slaughterhouses, entertainment venues, and the household. As laboratory medicine gained visibility as a marker of modern progress, however, animal welfare advocates increasingly turned to the fight against vivisection and other research techniques that sacrificed animals' lives in the name of science. Pasteur's rabies vaccination technique not only relied on animals as test subjects, but also required infecting a steady stream of rabbits with rabies in order to produce an attenuated virus for the series of injections used to build immunity in humans. In addition, Pasteur developed reliable means of using animal inoculation to detect rabies in the brain tissue of dead dogs, which defenders of animals' welfare viewed as yet another inhumane nightmare from the modern laboratory. As *Our Animal Friends*, the ASPCA's monthly journal, put it in late 1897, "The whole system of Pasteurism and of the antitoxin treatment is the outgrowth of innumerable experiments on living animals of the cruelest and most horrible description."¹⁴⁷

For the defenders of animals from human cruelty, Buisson treatment offered a gentle and viable alternative to Pasteurian rabies vaccination's despicable exploitation of animal life. Bergh recognized this possibility early on. In mid-December 1885, amid the hullabaloo surrounding the saga of four working-class boys from Newark sent to Paris to receive Pasteur treatment after their nasty encounter with an alleged rabid dog, Bergh announced his preference for vapor baths as a treatment option with an established track record.¹⁴⁸ Bergh's successors in the ASPCA, as well as leaders of animal welfare organizations elsewhere, echoed this position. *Our Animal Friends* em-

phasized that few suspect dogs actually carried rabies and regularly recommended vapor baths as the only necessary preventive and curative measure. As John P. Haines put it in the July 1897 issue, "The best thing you can do is just to take a few vapor baths, as hot as you can bear them."¹⁴⁹ Throughout the 1890s, the ASPCA also claimed rabies was so rare that not a single well-authenticated case had occurred in New York City during the years since the organization's founding. Although the society modified this stance by the early 1900s and conceded the existence of the disease, it still stressed, not entirely without reason, that fear of rabies far outpaced the actual threat to human health, and ASPCA president Haines continued to recommend vapor baths as the best course of action for hydrophobia.¹⁵⁰

Animal welfare advocates' critique of laboratory medicine created common cause with those physicians who remained unconvinced by Pasteurian rabies vaccination. According to Gerald L. Geison's incisive study of Pasteur, the French savant's medical critics quickly found themselves vastly outnumbered by their peers, and their strident, off-putting tone deterred support for even their legitimate objections, such as statistical evidence that suggested the numbers of people undergoing vaccination far exceeded those likely exposed to rabies.¹⁵¹ Although the well-known Philadelphia physician Charles W. Dulles, the foremost American critic, received a respectful hearing in the *Medical Record* in the late 1880s when Pasteur treatment was still new, his medical brethren became increasingly impatient with his intransigence as time went by. By 1901, veterinary expert D. E. Salmon, head of the US Department of Agriculture's Bureau of Animal Industry, declared Dulles an enemy of medical progress and lumped him with "those who oppose the results of modern science and the methods of modern sanitarians."¹⁵² Such accusations were unfair in that, as Nancy J. Tomes has explained, few American medical critics of germ theory and related developments denied the power of the laboratory and experimental evidence. Rather, they insisted upon standards of proof far more stringent than those deemed valid according to laboratory researchers.¹⁵³ As a result, discrepancies that most experts dismissed as minor became, for Dulles and other critics, evidence of fatally flawed theories. Advocates of animal protection, however, also papered over such subtleties: they regularly cited medical authorities to legitimize their opposition to vivisection, and they readily embraced Dulles and other physicians skeptical of Pasteur's hydrophobia preventative.¹⁵⁴

During the 1890s and early 1900s, an era of growing authority of both laboratory medicine and animal welfare organizations, differences over Pasteur

produced some visible clashes between the medical defenders of bacteriology and moral crusaders bent upon animal protection. In the spring of 1899, ASPCA president Haines refused to release a dog's body to the Department of Health on the grounds that testing the corpse for rabies by inoculating live animals would constitute animal cruelty. According to the *Medical Record*, Haines "seemed to care nothing for the utter demoralization of the persons who had been bitten, so long as he could save two or three rabbits or guinea-pigs." The ASPCA, however, retorted that its society "does not exist for the purpose of helping physicians to inoculate healthy animals with dead matter for the purpose of making an absolutely useless experiment," and its independently solicited autopsy from pathologist H. P. Loomis indicated that the dog died from heartworm.¹⁵⁵ Loomis, a confirmed skeptic who doubted the very existence of hydrophobia, would reverse his position in 1903, after the personal torment of witnessing the death of his 8-year-old son from rabies.¹⁵⁶ Salmon, in his detailed 1901 rebuttal to Dulles's critique of Pasteur treatment, also noted the ASPCA's appeals to Dulles's authority. Dulles, Salmon charged, did not merely indulge in medical obsolescence, but lent aid and comfort to the recalcitrant crowd of animal welfare advocates.¹⁵⁷

In this context, when Paul Gibier sent George Bockhaven for a vapor bath treatment in the summer of 1899, his referral may have been more a deliberate jab at hydrophobia denial than a last-gasp attempt to save a patient. The *Tribune* quoted Gibier as saying that after he recognized that Bockhaven had arrived too late to begin the vaccination procedure, "I decided that I would try the treatment advocated by those people who do not believe in our mode of treating hydrophobia. These people advocate medicinal vapor baths. I took Bockovan [*sic*] to Professor Rosencrantz's vapor baths, at No. 467 West Twenty-first-st., where he received the treatment twice." Gibier reported that the procedure only worsened Bockhaven's condition, and "after the second treatment the patient was returned to the [Pasteur] institute so weakened that restoratives had to be given him."¹⁵⁸ In this rendering, the vapor bath functioned less as a therapeutic intervention of last resort than a means of sticking it to the ASPCA and its supporters, as opposing sides battled over the use of animals for scientific and medical purposes.



The history of vapor baths as a hydrophobia remedy calls attention to a variety of circumstances: the transatlantic ties between European and American medical ideas and practices, the points of overlap between regular medicine and hydropathy, and the shifting grounds of authority that came with the rise

of germ theory, laboratory medicine, and American reform movements in the last third of the nineteenth century. As with the botanical *materia medica*, vapor baths underscored the shared constitutional principles and treatment strategies of warring medical sects, which made it difficult for allopaths to demonstrate the authoritative knowledge that they insisted distinguished their brand of medical practice from its competitors. The popularity of hydropathy and the politics of animal experimentation also sustained the fortunes of Buisson treatment for decades beyond Buisson's own lifetime, and animal welfare advocates provided support for medical critics of rabies vaccination who increasingly found their views marginalized within their own profession. Moreover, as this chapter has suggested, vapor baths were just one of multiple treatment options in which different cultural contexts, ranging from the local to the global, shaped therapeutic plausibility. The medical arsenal of allopaths alone drew upon folk traditions and conventional wisdom, regulars' own theoretical apparatus concerning the relationship between constitutionalism and contagion or the rationale for depletive versus stimulative treatment strategies, the new pharmaceutical offerings of nineteenth-century chemistry, and the ever-expanding botanical possibilities that came with global imperialism. On top of that, sectarians used their own, competing theoretical assumptions to recommend therapies, while traditional remedies ranging from herbal preparations to the madstone gave Americans a full range of options that encompassed both medical and popular culture.

The question of medical decision-making amid this dizzying variety of therapeutics had particularly acute implications in the context of a self-consciously democratic society. Throughout the nineteenth century, regular physicians warned of the dangers of quackery and credulity. As a solution, they promoted the cultivation of discerning judgment in order to democratize therapeutic choice even as they simultaneously touted the virtues of their own expertise. By contrast, toward the end of the nineteenth century, critiques of germ theory suggested the perils of doubt and its threat to spill over into denial and nihilism. If madstones provided urbanites the opportunity for smug contemplation of their own self-perceived sophistication and ability to identify humbug, attacks on Pasteur indicated the limits of useful skepticism. Each end of the spectrum from belief to doubt posed different kinds of risks that highlighted the longer-term challenges of truth determination in an increasingly complex society characterized by specialized forms of knowledge.

Physicians themselves also had to grapple with the challenges of belief

and credulity in response to startling new medical discoveries that seemed to arrive at an ever-quickenning pace by the last third of the nineteenth century. For them, pathological anatomy provided a theoretical framework that anchored their understanding of the physical and physiological basis of hydrophobia, and that served as a guide for gauging the plausibility of dramatic new claims. When New York's medical community took the measure of William A. Hammond's purported discovery of a characteristic lesion of hydrophobia in the 1870s, the rise of germ theory and Pasteurian rabies vaccination in the 1880s, and the use of Negri bodies as a diagnostic tool in the early twentieth century, anatomical commitment would serve, whether rightly or wrongly, as physicians' lodestar.

The Lesion of Doom

Anatomical Tradition and the Problem of Hydrophobia

In addition to its therapeutic challenges, rabies resisted explanation and understanding at an anatomical level, in a baffling conceptual void that exposed the very foundations of nineteenth-century American medical science. In accordance with paradigmatic assumptions about the nature of disease, physicians believed that hydrophobia had to exhibit a distinctive pathology, one that would leave unique, visually identifiable markers in the physical structures of the body. Consequently, from the mid-nineteenth century onward, New York's medical elite traded ideas and body parts, contested postmortem findings, rendered official opinions, and staked reputations on autopsies and their presumptive ability to offer precise diagnostic tools and reveal the full physiological dimensions of rabies. The city coroner's office frequently ordered postmortems as part of its efforts to determine the cause of death in suspected hydrophobia cases. Dogs' bodies came under the dissecting knives of physicians and veterinary experts as well. Yet, despite decades of attempts, morbid anatomy in both humans and dogs, and at both the macroscopic and microscopic levels, provided only a confused, messy trail of congested organs, vascular irregularities, and vaguely abnormal appearances in different anatomical structures.¹ Time and again, the disease defied fundamental principles, and countless autopsies failed to produce any conclusive findings. Nonetheless, as the experiences of New York's elite physicians show, anatomical commitments continued to frame physicians' struggles to make etiological sense of rabies.

Anatomy's centrality to American medicine in the late nineteenth century and beyond has too often gone underappreciated in comparison with germ theory and public health. Discerning analyses by Michael Sappol and other scholars, however, have demonstrated the field's importance to medical prac-

tice, physicians' own self-fashioning, and popular culture. In the United States, anatomy defined the essence of medical science and what it meant for physicians to claim authoritative knowledge both as individuals and as a community. Established anatomical traditions in the United States, combined with the American reception of French pathological anatomy in the first half of the nineteenth century, followed by the development of new instruments, techniques, and concepts that allowed ever-more finely grained inspections of the body at the cellular level by the middle decades of the century, also created strong expectations about the physical, material nature of pathology and the necessary anatomical imprint that deadly diseases left behind. In the face of the frustrations of existing postmortem evidence, the rise of microscopy and an ever-proliferating array of new histological techniques for uncovering the secrets of bodily tissues conveyed the tantalizing sense that where past methods had failed, the next scientific advancement would surely reveal the characteristic lesion of hydrophobia.

New York City's medical establishment and, in the early twentieth century, some of its leading laboratory researchers in public health occupied central places in this hydrophobia-oriented history of medical expectation and its repeated thwarting. In 1874, prominent physiologist, military medical reformer, and neurologist William A. Hammond claimed to have identified an important lesion in the autopsy of hydrophobia victim William McCormick. His findings quickly fell apart in an acrimonious dispute that humiliated Hammond and laid bare the occasional viciousness of medical egos in elite circles, but did not dampen broad-based faith in the explanatory power of pathological anatomy. In the late 1880s and 1890s, Philadelphia and New York-based neurologist-critics of Pasteurian rabies vaccination appealed to somatic principles and concrete physiological mechanisms as a corrective to what they saw as the overly speculative nature of germ-based conceptions of disease. Their intellectual allegiances underlined the continued power and persuasiveness of anatomical explanations for disease processes. In the early 1900s, the identification of Negri bodies in the brain tissue of rabid dogs seemed finally to fulfill the promise of anatomical explanation, especially after Anna Wessels Williams of the New York City Department of Health's Research Laboratory used the discovery to develop a novel method for rapid diagnosis of rabies in dogs postmortem. Yet, as we will see, that pathbreaking development also gradually unraveled. For American physicians in the nineteenth century and beyond, anatomy offered powerful and convincing means

of understanding the bodily basis of disease and its physiological manifestations. Rabies, however, continued to perplex the anatomical imagination.

Autopsy, the Embodiment of Disease, and Anatomical Frustrations

American physicians' belief in specific physical markers of disease originated from an anatomical view of medical science that dominated American medicine in the first half of the nineteenth century. Michael Sappol has shown how aspiring medical professionals built their authority and identity on the culturally prestigious foundations of anatomy and dissection, and how they used mastery over the body and its tissues to distinguish themselves as men liberated from superstition, who rightly claimed a place in "the world of science, learning, and gentility."² As John Harley Warner has emphasized, during this time period, elite American physicians eagerly promoted empirical observation over "rationalistic medical systems"—that is, constitutional theories about bodily balance or other abstract and speculative schemata for understanding health and the body—as a way to set themselves apart from various irregular practitioners.³ In this context, anatomy offered an ideal means for physicians to assert the superiority of professional authority based on skill at the dissecting table and unrivaled understanding of the body through close study of its structures. As discussed in the previous chapter, most American medical practitioners, including those among the elite, never entirely abandoned constitutionalist medical discourses. At the same time, however, empiricism suggested that specific, physiological explanations describable in material terms provided superior explanations for conditions understood earlier through the conceptual lens of imbalance and disturbance, particularly for ambitious urban physicians who wanted to identify themselves as at the forefront of medical science.⁴

The prestige of Parisian study as a way for strivers to build their reputations further enhanced this stated loyalty to empiricism and its basis in anatomical commitment. Faced with limited access to bodies throughout much of the antebellum period, Americans flocked to the dissecting tables of Paris.⁵ There they also absorbed the principles of French pathological anatomy, the centerpiece of so-called Paris medicine, which sought to integrate the clinic with anatomical inquiry by matching symptoms in living patients with visible abnormalities in organs and tissues postmortem. American practitioners generally found little to admire in Parisian clinical practice, in which the patient's well-being too often took a back seat to the quest for medical knowl-

edge. At the same time, they eagerly adopted and adapted the basic conceptual apparatus of French pathological anatomy, with its mission of determining and describing the physiological mechanisms by which localized disease events created symptoms throughout the body, as part of their own commitment to scientific pursuits.⁶

Then, in the mid-nineteenth century, a whole host of laboratory-based developments continued to transform medical investigations and raise expectations for understanding disease. The “new pathology” rapidly emerged from the major European centers of medical science, whether in the form of chemical analysis of metabolism inspired by Justus von Liebig, the wide-ranging physiological insights of the Berlin-centered circle of Carl Ludwig, Hermann von Helmholtz, Ernst von Brücke, and Emil du Bois-Reymond, the cellular pathology of Rudolf Virchow, the experimental physiology of Claude Bernard, or other research programs. This era of discovery sometimes left American physicians trained in earlier conventions of morbid anatomy feeling at sea amid wave upon wave of novel techniques, or concerned that something intangible yet necessary to medical practice was being left behind.⁷ But the new pathology also built on the old, especially for Americans who felt free to pick, choose, and synthesize among the ideas and practices of the sometimes-warring medical parties on the European continent. For them, the bundle of advancements in microscopy, chemical methods and diagnostics, histology, electrophysiology, and other developments that connoted state-of-the-art medical science enhanced their preexisting confidence in the attainment of pathological understanding through examination of the human body in ever-finer detail.⁸

As a consequence of this blend of traditional American anatomical faith, the old French emphasis on detection of lesions, and new laboratory methods, a discourse of anatomical specificity and commitment to the value of postmortem analysis pervaded American discussions of hydrophobia from the mid-nineteenth century onward. In the New York-based medical literature of the early 1870s, a spate of reports suggested the detection of specific anatomical changes in hydrophobia cases or individual physicians’ certainty that postmortem analysis confirmed rabies as a cause of death. In 1871, for example, the *New York Medical Journal* relayed a report from the German language medical literature of a Professor Rudnew’s insistence that microscopic analysis showed specific abnormalities in the kidneys of rabid dogs that could be linked to uremic symptoms.⁹ For every report such as Rudnew’s that highlighted the significance of novel laboratory techniques, another spoke

in the established idiom of the detection of lesions.¹⁰ Discussions in the city's medical societies also demonstrated the strength of anatomical discourses. In July 1874, amid the public hype surrounding Hammond's pronouncements of important new pathological discoveries in the McCormick autopsy, Dr. John P. Garrish accepted Hammond's findings as established fact and asserted the existence of definitive lesions in hydrophobia cases. In a paper he presented before the city's Medical Library and Journal Association, Garrish stated, "As the true pathology of the disease has been pointed out and lesions have been discovered in the medulla oblongata, brain, and spinal column, this leads us to treat it on true scientific principles and with some hope and certainty of success."¹¹ Meanwhile, stories in the mass media also perpetuated a lesion-based doctrine of disease. As the *New York Herald* noted in late June 1874, hydrophobia "has been called a disease without a lesion." The next sentence left no doubt as to the *Herald's* view of medical science: "'Diseases without lesions' are of course merely diseases in which science has not yet been able to locate the lesion."¹²

Such conclusions rested upon an axiomatic faith that diseases left unqualified visual evidence of their presence, which physicians could identify if only they developed the right means and powers of observation. In essence, this conviction placed new techniques and instruments in service of the search for distinctive lesions according to the expectations of French anatomical traditions. The general medical consensus throughout the nineteenth century, however, held that the unique pathological markers of hydrophobia remained frustratingly elusive, despite occasional claims to the contrary. Case histories, literature reviews, and medical treatises repeatedly underscored hydrophobia's postmortem vagaries.¹³ As Thomas W. Blatchford noted in the 1853 death of 8-year-old Michael Delany at an orphanage in upstate New York, "A post-mortem examination was made, but nothing very satisfactory ascertained. The lungs and breathing tubes were injected with blood. The blood was not coagulated; it was fluid and dark colored."¹⁴ In 1856, J. Lewis Smith's comprehensive review of hydrophobia cases highlighted the sad state of anatomical affairs: "It has been truly said that post-mortem examinations have failed to throw much light on the pathology of hydrophobia." Although the vascular and nervous systems frequently showed certain unusual features, investigations by the very best anatomists and pathologists had revealed "no lesion or alternation uniformly present, so as to be looked upon as essential."¹⁵ Yet, even as his account demonstrated the paucity of useful postmortem results, Smith's attentive descriptions of morbid appearances from the existing

literature testified to his continued regard for pathological anatomy and its value.¹⁶

Subsequent decades of anatomical inquiry shed no additional light on hydrophobia. Sometimes the disease left no noteworthy markers on the body at all. As S. W. Budd tersely noted in his case history of a hydrophobia death at New York's Roosevelt Hospital in 1876, "Autopsy made by the coroner, but nothing remarkable was found."¹⁷ When a 6-year-old boy on the Upper East Side died from rabies in 1878, the *New York Times* noted that a planned autopsy would serve only to rule out other causes of death and not to confirm the attending physicians' diagnosis. "All post-mortem appearances in these cases," the story reported, "have been found to be of a negative character, and the investigation is made more to exclude other diseases than with the expectation of finding any particular lesion pathognomonic of hydrophobia."¹⁸ Medical texts, such as Horatio Bigelow's extensive review of the literature on the pathology and morbid anatomy of rabies in his 1881 treatise on hydrophobia, also acknowledged the failure of morbid anatomy to provide useful information about rabies. Bigelow observed that although hydrophobia cases frequently exhibited certain types of lesions, those abnormalities were secondary, rather than primary, and in some cases likely produced by treatments and not the disease itself. Moreover, animal evidence provided no useful indicators, and microscopic examination of bodily tissues failed as well, with cellular abnormalities explained too easily as secondary irritations rather than primary lesions.¹⁹ Medical science could identify some general post-mortem tendencies, but "there is no definiteness or uniformity in the pathological conditions found after death in different cases of hydrophobia." At best, microscopic examination revealed lesions common to multiple conditions that caused what Glasgow professor George Middleton termed "cerebral excitement," but nothing more definitive.²⁰

To physicians' chagrin, the anatomical knowledge that lay at the core of medical science consistently failed to identify distinctive lesions or offer any other insights into the specific physiological nature of hydrophobia despite decades' worth of postmortem examinations. Patient histories and observed symptoms, and not definitive postmortem changes in the organs and tissues of the body, continued to provide the best diagnostic evidence. Nonetheless, medical professionals persisted in anticipating the emergence of definitive pathological indicators, sooner or later. No episode illustrated more clearly the power of such expectations, as well as the controversy they could stoke among medicine's finest, than William A. Hammond's claimed breakthrough.

Hydrophobia, Autopsy, and the Culture of New York Medicine: The McCormick Case, 1874

In the summer of 1874, anatomical frustrations among the upper crust of New York medicine boiled over into a bitter dispute that showcased simultaneously pathological anatomy's hold over the American medical imagination and its seeming futility in yielding insights about rabies. After William McCormick's death from hydrophobia, the postmortem analysis by prominent physician and neurologist William A. Hammond momentarily raised hopes of a major advance in scientific understanding. Instead, disagreements within the coroner's jury and the confines of medical society meetings spilled over onto the pages of newspapers and medical journals, and the initial excitement deteriorated into verbal fisticuffs, recriminations, and acrimonious disputes over the custody and proper handling of tissue samples, the meaning of cellular appearances, and the appropriate boundaries of medical authority.

The episode is worth recounting in detail for what it says about New York's medical elite and the higher stakes of morbid anatomy within the social world of the city's medical establishment. The affair did more than just highlight the significance of anatomical explanation, especially in the form of evolving physiological and neurological interpretations of disease mechanisms, to medical understandings of rabies in the late nineteenth century. In historical retrospect, it opens a window onto the ambiguities and challenges of the new pathology, in which physicians struggled with how to see and comprehend the cellular realities revealed by modern methods, especially microscopy and histology. The confrontation between Hammond and his critics also exposes the social settings of the new pathology and how they elevated the risks and rewards of pathological authority and judgment. The context of an official autopsy and inquiry by the coroner's office meant that questions of medical and scientific meaning merged with the needs and priorities of local governance and public policy. Press coverage and public scrutiny further heightened New York medical elites' already heated contest for reputation and status, as they laid bare competing claims about expertise, professional etiquette, and the pathological truths of hydrophobia.

On June 22, 1874, William McCormick, a butcher and deliveryman who lived on East 51st Street, began to complain of weakness and numbness in his arms, back, and neck. He initially thought he was suffering from rheumatism, but three days later, his symptoms included severe thirst, a nervous appearance, and the onset of slight spasms when he attempted to drink. By the time

Dr. Alexander Hadden arrived to examine him on Wednesday morning, McCormick could take liquids only with extreme difficulty, and he exhibited signs of delirium. Hadden immediately suspected hydrophobia, and McCormick's admission that he had been bitten by a dog several weeks earlier further strengthened the diagnosis. That evening, Dr. W. E. Leavitt concurred with Hadden's assessment, and the two physicians attempted palliative measures as they awaited a fatal outcome. McCormick's condition worsened rapidly with increasingly powerful paroxysms that anodynes and narcotics failed to mitigate, and he endured agonizing convulsions for hours. Finally, at 5 p.m. on Thursday afternoon, his body slackened, and McCormick's struggle was over.²¹

As an odd case that gave physicians an opportunity to witness a rare disease, McCormick's slide into illness and death attracted intense notice from the city's medical community, and doctors descended on the McCormick family home to observe and debate his symptoms.²² Besides Hadden and Leavitt, news stories specifically identified seven other physicians, including Hammond and city health officials Charles P. Russel, August Viele, and Allan McLane Hamilton, who arrived during McCormick's final hours along with the anonymous "others" or even "many others" mentioned in New York's dailies.²³ In addition to Hadden and Leavitt's diagnosis, this assemblage of medical experts also concluded collectively that, as the *Tribune* put it, "the case was one of true hydrophobia, and that no doubt could be cast upon its genuineness."²⁴

The McCormick case, which followed the closely reported drama of Brooklyn dog fancier Francis Butler's death from hydrophobia just days earlier, sparked fears that a major rabies outbreak was unfolding in New York City. Consequently, interest in McCormick's sad and horrific demise moved beyond medical circles to become a major news story, and when the city coroner mandated an autopsy and inquest, the press continued to follow developments closely. Headlines also filled with daily dispatches on numbers of stray dogs that police killed in the city's streets, news of mad dog scares, commentaries about the need for more effective canine animal control, stories on the natural history of hydrophobia and the virtues or lack thereof of various proposed remedies, and reports of new human hydrophobia cases, both real and imagined. Fear melded with fascination as details about McCormick's death and autopsy emerged amid widening concerns about what seemed like a season of rampant hydrophobia.

This combination of sustained public interest and alert professional scru-

tiny placed Hammond's postmortem findings at the center of attention in New York City for weeks throughout the summer of 1874. Hammond was one of the leading lights of American medicine, and by the 1870s, he had built his professional identity around broad interests in physiology and neurology, as well as an eagerness to use new techniques from medical chemistry, microscopy, and histology to illuminate bodily processes and the workings of pathology. As a medical student decades earlier, he had learned to reject vitalist conceptions of physiology in favor of strictly physical and chemical explanations, and in his early career as an army physician based on the Kansas frontier in the 1850s, Hammond drew inspiration from von Liebig's physiological chemistry and from the dynamic physiology of Ludwig and his confreres as he pursued research on the chemistry of blood and urine. Hammond also reached out to medical and scientific circles in Philadelphia, where he spent a year's leave from active duty in 1858, and his investigations earned recognition in Europe as well, particularly from the eminent French physiologist Charles-Édouard Brown-Séquard. This growing stature paved the way for Hammond's Civil War-era appointment as surgeon general, where his transformation of the army hospital into an important site for sanitary improvement, statistical analysis of wartime injuries, and anatomical investigation further enhanced his reputation as a medical innovator.²⁵

Hammond's military career ended on a sour note, however, when his effort to prohibit the use of calomel and tartar emetic, two overused mainstays of the heroic medical arsenal, generated enemies and trumped-up charges of bureaucratic impropriety that led an indignant Hammond to demand a court martial, which he received and which led to his dismissal. Hammond moved to New York City in the winter of 1864–65 to tend to his wounded pride and seek his fortunes in civilian life as a specialist in diseases of the mind and nervous system. He soon obtained formal academic appointments, and through his manifold activities as a journal editor, treatise author, and energetic participant in multiple medical societies, as well as a prominent institution-builder in New York medicine, he established a distinctive place for himself as part of the city's medical elite. Hammond never forgot the slights that had ended his military career, however. He continued to challenge the court martial verdict, and in 1879, he finally won exoneration on the charges of military misconduct.²⁶

On the whole, Hammond's career signified the prominence of materialist approaches to physiological explanation and the importance of laboratory medicine to professional ambitions in the second half of the nineteenth cen-



William A. Hammond, 1877. Courtesy of the US National Library of Medicine.

tury. During the Civil War, for example, his effort to imitate the Parisian model by turning army hospitals into sources of clinical cases and postmortem analysis for purposes of study, combined with his interests in medical chemistry, microscopy, and physiology, suggests the fusion at work in Hammond's career between the older traditions of medical empiricism and midcentury advancements in instrumentation and laboratory methods. Hammond's devotion to the novel, postbellum specialty field of neurology also reflected his long-held commitment to the material basis of bodily phenomena. Neurology, with its roots in physiology and emphasis on materialist, somatic mechanisms to explain the symptomatic manifestations of physical damage to the nervous system, emerged out of a new age of specialized medical expertise, combined with the direct experiences of a generation of army physicians, including Hammond, who treated and studied gunshot wounds and other battlefield injuries. In line with increasingly dominant understandings of nervous disease as the product of specific somatic conditions, Hammond viewed mind and body as an integrated system in which diseases of the mind originated from physical derangements in the body. This somatic approach also incor-

porated the legacy of French pathological anatomy, which led Hammond and other early neurologists to correlate symptoms with lesions or, in diseases in which the lesions remained unknown, to infer the underlying physiology of disease from symptoms.²⁷

Hydrophobia, with its combination of mental and physical symptoms, along with false cases in which sufferers seemed literally to scare themselves to death, was irresistible to a neurologist interested in the relationship between mental states and physiological pathology, and Hammond avidly sought out patients stricken with hydrophobia for observation. He devoted a chapter of his 1871 tome, *A Treatise on Diseases of the Nervous System*, to the disease, and by the time he saw William McCormick, he had already witnessed five previous cases, a relatively high number for such a rare condition. Hammond's treatise had acknowledged the general lack of pathological understanding of hydrophobia, but by 1874, he believed that medical science was gaining ground and that morbid anatomy would finally produce needed insights. Hence for him, the McCormick case offered a golden opportunity.

The postmortem examination took place on the day after McCormick's death, in the rear parlor of the family's home. The coroner convened a prestigious gathering of the city's medical patricians for the event, in an assemblage that reflected the public significance attached to a potential hydrophobia outbreak, as well as the stature of medical expertise in New York City in the post-Civil War period. The deputy coroner took charge of the dissection, with assistance from Hammond and two other local medical luminaries: Abraham Jacobi, the renowned reformer and expert in obstetrics and pediatric medicine; and T. M. B. Cross, a colleague of Hammond's at the New York State Hospital for Diseases of the Nervous System, as well as a founding member, along with Hammond, of the New York Neurological Society. Observers included Frank H. Hamilton, whose military career as an army surgeon in the Civil War led to prominence as a leading surgeon and active medical professional in New York City during the postwar decades; Meredith Clymer, another Civil War surgeon who was well recognized in New York medical circles after the war for his expertise in pathology and diseases of the nervous system; and, from the Department of Health, sanitary inspectors Charles P. Russel and Allan McLane Hamilton.

As expected, visual examination of the major organs revealed nothing noteworthy beyond congestion in the brain and throat, but Hammond took tissue samples with the confidence that microscopy and histological investigation—two prominent symbols of medical advancement associated with the power

of new instruments and laboratory techniques—would succeed where gross anatomy had always failed. He freely conveyed his expectations to the press that the medulla oblongata, the lower half of the brainstem, would contain what the *Tribune* described, in a translation of French medicine into an American popular medical idiom, as “the lesion, the real seat of the disease.”²⁸ The medulla oblongata emerged as a focus of hydrophobia investigations as early as the 1850s, and by the early 1870s, Brown-Séquard and other prominent figures in the overlapping fields of physiology and neurology concentrated on the structure as an important locus of psychophysical phenomena, including the emotions and spasmodic conditions such as “nervous hydrophobia.” Indeed, in his 1871 treatise, Hammond had already speculated that the symptoms of hydrophobia suggested “a hyperaesthetic condition of the hemispheres, the medulla oblongata, and the upper part of the spinal cord.”²⁹ McCormick’s death provided an ideal opportunity for Hammond to test this hypothesis, and within days, newspapers reported Hammond’s triumphant belief that his preliminary microscopic analysis revealed specific changes in the medulla oblongata, in particular, fatty deposits on the pneumogastric nerve (better known today as the vagus nerve), associated with hydrophobia.³⁰

News stories were already buzzing with excitement about the potential of microscopy to facilitate dramatic medical advancements, and even though Hammond quickly backpedaled and suggested that his histological analysis merely confirmed the findings of English physician Clifford Allbutt two years earlier, the story of the McCormick postmortem became a minor public sensation.³¹ In the days leading up to the July 6 meeting of the New York Neurological Society, which planned an entire session around discussion of Hammond’s results and the management of the city’s dog population, anticipation continued to build, and rival papers, particularly the *Tribune* and the *Herald*, took opposing sides on whether Hammond had made a major discovery.³² The meeting itself attracted extensive press coverage, with some papers paying especially lavish attention to the details of the McCormick autopsy, including the appearance of the gross anatomical structures, the procedure for sectioning tissue samples, and the cellular pathology of different parts of the brain, spinal cord, and pneumogastric nerve as observed by microscope. The willingness of the daily papers to relay blow-by-blow accounts of pathological anatomy highlighted the mass appeal of anatomical inquiry, as well as the blurred boundary between medical and popular journalism.³³ Press attention also meant that physicians’ debates took place not just in front of fellow medical professionals, but in the theater of public opinion.

In the paper he read before the New York Neurological Society, Hammond continued to temper his conclusions. After describing the histological evidence in detail, he concluded that “the microscopical appearances indicate defective nutrition of the nervous centres” and “breaking down of the nerve elements,” which he interpreted as consistent with Allbutt’s earlier observations, but, he conceded, he could not affirm “that these are essential conditions of hydrophobia.” He left room open for the possibility of a major advancement in scientific knowledge, however, by suggesting that his findings established “a sort of pathological tripod on which hydrophobia rests, and which accounts for the main symptoms which the disease exhibits.” The search for the definitive lesions of hydrophobia, Hammond believed, needed to focus on the triad of the cerebral cortex, the medulla oblongata, and the spinal cord, where observed pathological abnormalities correlated with the typical mental and physical symptoms of clinical cases.³⁴

The verdict of the coroner’s jury, however, soon dashed any hopes Hammond maintained that the McCormick autopsy would enhance his record of scientific achievement. Instead, the jury’s findings prompted a raucous debate between warring physicians over the proper relationship between physicians and the press, the appropriate laboratory techniques and etiquette for handling tissue samples, and legal action. In response to the frenzy surrounding rabies in the summer of 1874, in which two additional reports of possible hydrophobia victims followed the deaths of Francis Butler and William McCormick, Coroner Kessler issued an unusually broad charge to the jury. Rather than simply asking for a determination of cause of death, he also instructed the assembled medical experts to recommend the best methods for treating dog bites, consider improved means of canine animal control, and determine whether the postmortem examination of McCormick’s body had produced any significant advancements in the scientific understanding of rabies. On this last point, Hammond testified at the inquest on July 15 that the abnormalities uncovered by his histological examination almost certainly resulted from the disease pathology of rabies, and he felt increasingly confident “that this may be the true and constant diseased action in hydrophobia.”³⁵

The assembled medical experts, however, found otherwise. On the evening of July 17, two days after the inquest, the coroner’s jury met at the home of foreman Frank H. Hamilton and deliberated for more than four hours before issuing its verdict just after midnight. The jurors identified hydrophobia as the cause of McCormick’s death, recommended thorough excision of the wound followed by cauterization as the best response to cases of dog bite,

and suggested a tax on owned dogs as a means of reducing the number of dogs on city streets. As for “the direct question of the Coroner whether the post-mortem investigations in this case are of any scientific value in determining the pathogeny of the disease,” the jury split 6–4, with the majority answering “in the negative.”³⁶

With this ruling, Hammond’s pathological analysis entered the historical catalog of ambiguous rabies autopsies, and an anatomical inquiry that had started with promise and excitement ended in disappointment, chagrin, invective, and remonstrances. Some physicians blamed the press for sensationalizing the McCormick autopsy and raising false hopes. As the *New York Medical Journal* opined, “The public has been rather entertained than instructed,” and serious discussions of pathological anatomy belonged solely on the pages of medical journals, and not in the daily newspapers. George F. Shrady, the well-known surgeon, surgical pathologist, and acerbic editor of the *Medical Record*, also targeted “our brethren of the daily press” for the “Lyssomania” that had taken over the city.³⁷ No complaints arose when a scientific triumph seemed in the offing, but once the coroner’s jury ruled Hammond’s post-mortem investigation a failure, the New York medical community called upon physicians to circle their wagons, limit professional discussions to the medical press, and maintain a strict line between physicians and laypersons.

Indeed, Shrady lashed out at Hammond himself for courting attention from the press, in addition to other violations of proper medical conduct. The media, he suggested, could be forgiven for its overenthusiasm, but not the physician who merely feigned circumspection and instead puffed himself up through irresponsible “*professional sensationalism*.” Although Shrady did not name Hammond directly, no one who had followed the story of the McCormick autopsy in the papers could have mistaken the object of his ire. The incensed editor then went on to attack Hammond’s sample preparation techniques. “How youthful, inexperienced microscopists must have envied that ‘scientist’ who was able, by ‘sufficiently thin sections,’ to demonstrate these remarkable distinctions in a specimen ‘kept in absolute alcohol 18 hours;’” Shrady observed sarcastically. The implication here was that no useful histological samples could be prepared so quickly, an issue that Charles Russel and Abraham Jacobi would soon address more directly and in greater detail.³⁸ Finally, Shrady condemned Hammond outright for shoddy work, and he accused him of disrespecting professional ethics through a self-aggrandizing refusal to allow others to participate in his histological investigation and in his attempted monopolization of tissue samples. Hammond, Shrady alleged,

had ungenerously kept others away not just from the tissue analysis, but from the tissues themselves. According to Shrady, “Dr. H.” had sought “to appropriate all of interest in McCormick’s brain,” just as he had also tried to intervene in the autopsy of Roderick Entwistle, another suspected victim of rabies who died shortly after McCormick, and gain exclusive control of those samples until “the arrival of the curator of Bellevue made it necessary for him to deliver up two or three thin slices.”³⁹ In short, Hammond had conducted himself poorly both in public and in the laboratory, through his unseemly cultivation of press coverage and his domineering attitude toward the pathological analysis.

An embattled Hammond took offense not just at Shrady’s remarks, but also at the coroner’s jury, as well as the city’s medical examiners. As Shrady’s comments indicated, Hammond had already tussled with the coroner’s office over a second autopsy. Roderick T. Entwistle, a local printer, was bitten by a dog while visiting a saloon near his home on the southern edge of Greenwich Village back in April. He contracted hydrophobia-like symptoms in late June and died at Bellevue Hospital on July 1. Physicians differed over whether he had succumbed from fright or true hydrophobia, and some eighteen medical men, including Hammond, gathered at the Bellevue dead house soon after Entwistle expired in the hopes that a postmortem examination would settle the question. Two hours before the coroner’s scheduled arrival, the eager Hammond convinced his medical brethren that an early start would be permissible, even though some of his colleagues doubted the legality of performing the autopsy in the coroner’s absence. When the coroner and his deputy finally arrived, they were more than a little miffed by the physicians’ autopsical impatience. The *Herald* reported that Hammond might even face legal action as a result of his “undue and unnecessary haste.”⁴⁰

Hammond and the coroner’s office were thus already at odds when the jury reached its negative conclusions about the McCormick autopsy, and the easily provoked neurologist did not spare the coroner from his wrath. On July 30, the *Tribune* published a letter from “Science”—quite possibly Hammond—which complained that Coroner Kessler had improperly gone beyond his authority by giving the jury an overly broad charge in the McCormick inquest, rather than limiting its purpose to the determination of cause of death.⁴¹ When the controversy shifted from the daily papers to the medical press, Hammond openly repeated the charge in the September issue of the *New York Medical Journal* and declared that the coroner had acted “in excess of his powers.”⁴²

Both Hammond and “Science,” his likely alter ego, pitted themselves against the jury as well and focused on who properly possessed the expertise to speak authoritatively about microscopy and cellular pathology. Beneath the assumed theoretical rigor of the new pathology, with its established roots in anatomical tradition, lay the messiness of laboratory results and the difficulties of putting new techniques into practice. Here Hammond made his stand. “Science” lambasted the jury members for blindly following along with the coroner’s improper directive and excoriated their lack of “preeminent qualifications for inquiring into the pathology of hydrophobia, or of estimating the value of microscopical investigations.” Hammond then followed up at length in September with further attacks on the competence of the majority that had decided his histological findings were of no scientific significance. “The symptoms of hydrophobia,” Hammond insisted, “are of such a character as to show that the cortical substance of the brain, the medulla oblongata, and the spinal cord, are in some way or other disordered,” and Allbutt had already discovered that “the cortical substance of the brain was in a state of granular degeneration” in two previous rabies cases. To deny a connection between symptoms and the underlying pathology that he had identified in his examination of McCormick’s brain, Hammond indicated, was nonsensical: “Will the gentleman of the majority pretend to tell us that there is no relation between delirium and structural changes in the cortical substance of the brain?” To this basic invocation of French medical tradition and its correlation of symptoms and lesions he added that cellular abnormalities in various nerve tissues from McCormick’s body also corresponded with well-known hydrophobia symptoms. But the jury’s majority was too far out of its element when it came to these matters: “It is not to be supposed that physicians who are not histologists or microscopists can give a very decided answer to such questions.”⁴³ Hammond’s position underscored the primacy of new laboratory techniques, which revealed the workings of the body through physiological processes at the cellular level. Medical scientists required expertise in advanced forms of instrumentation and technique, namely, the microscope and histology, to access this world that was otherwise invisible to the naked eye. The majority of jury members, Hammond contended, lacked the requisite technical command and therefore would have done better not to take up the coroner’s challenge. Instead, they had veered beyond their competence and erred in their findings.

Hammond then turned to criticisms of his sample preparation technique. He claimed that his protocols rested upon other researchers’ long-established

practices as well as his own years of experience, and he argued that the lengthier chromic acid fixation that Abraham Jacobi apparently advocated, while preferable in some cases, also tended “to cause disintegration of tissues already altered by morbid process.” Furthermore, Hammond contended, alcohol simply could not produce the kinds of pathological changes he had observed, and he insisted that anyone with “the slightest acquaintance with microscopical manipulation” would know that “such a result would be impossible.” Hammond then added an indignant profession of his own qualifications: “I did not venture upon a task for which I was unprepared. I have been a microscopist for more than twenty years, and have labored not altogether without success to advance science in the direction of histology.”⁴⁴

Hammond did not rest content with debating technical matters. His court martial years earlier had demonstrated his quickness to respond vigorously, even recklessly, to defend his reputation against any slight, an instinct that again came into play in the debate over the McCormick autopsy. Hammond melded questions of pathological analysis with accusations that his critics violated professional etiquette by indulging in personal attacks, and he resorted to legal action to defend the propriety of his own conduct. First, he excoriated Jacobi and Russel for what he termed their “hostile” attitudes. Russel, who had authored a lengthy review essay on the natural history of hydrophobia for the Department of Health in the summer of 1874, and who possessed a strong local reputation as a public health official, also delivered a sharp critique of Hammond’s work in the July 15 issue of the *Medical Record*, in which he contested the neurologist’s identification and interpretation of the lesions that he had described. Russel pointed out that, contrary to the findings of Allbutt and Hammond, earlier microscopical studies, including those of the esteemed British veterinary expert and hydrophobia treatise author George Fleming, had found no distinctive markers of pathology in either the medulla oblongata or any other part of the brain. Furthermore, Russel argued, the “fatty degeneration” that Hammond reported was not necessarily the same phenomenon as the “granular disintegration” that Allbutt had observed, and anyway, the abnormal morbid appearances could have easily resulted from the atropine administered to try to ease McCormick’s symptoms.⁴⁵ Russel presumably offered the same criticisms during the deliberations of the coroner’s jury, and his skepticism sparked Hammond’s defensive response. As for Jacobi, Hammond accused the German-born physician of indulging an unwarranted ethnocentrism in his assessment of Hammond’s laboratory work: “Dr. Jacobi might with truth allege that I am not German,

but I have the most sincere appreciation of the acquirements of our Teutonic brethren, and surely the mere fact of an inquirer having the misfortune to be born an American should not suffice to deprive his investigations of all scientific value.”⁴⁶ In addition, Hammond denied any impropriety in his dealings with the press, and at the end of August, he filed a libel suit against the *Medical Record*.⁴⁷

None of Hammond’s medical critics backed down. Russel denounced Hammond’s “slurs upon Dr. Jacobi’s nationality” as “foreign to the subject” and his attack on Jacobi’s “competence in pathological knowledge” as “extremely injudicious.” He also challenged Hammond’s claimed authority on the latest laboratory methods and directly questioned the neurologist’s reputation for achievement in cellular pathology. “I am by no means aware,” he declared, “that Dr. Hammond himself has contributed to the records of microscopical anatomy, pathology, or pathological physiology . . . any observations sufficiently original or valuable to constitute him an infallible authority in these most abstruse branches of minute investigation.”⁴⁸ At the level of both histological technique and interpretation, Russel found fault in Hammond’s work. Hammond said he had prepared his samples according to well-established protocols by Lockhart Clarke and Heinrich Frey, but Russel pointed out that their procedures required several weeks of hardening in reagents prior to slicing thin sections, and not the mere eighteen hours Hammond had employed. He also quoted a cautionary warning from Frey on the interpretation of microscopic results: “‘Many observers have certainly exaggerated the results of their investigations very much, frequently drawing very false conclusions from fragmentary, isolated appearances.’” Too often, the power of microscopy generated an excess of enthusiasm, in which every intriguing observation became grounds for exciting claims of discovery. Hammond, Russel implied, had compounded the error of bad sample preparation with an overblown reading of the visual evidence.⁴⁹

Other circumstances, Russel argued, also militated against Hammond’s claims. Where Hammond saw a distinct lesion of hydrophobia, Russel identified ordinary postmortem conditions. “It is well-known,” he observed, “that granular and fatty degeneration of the nerve-cells is not an uncommon pathological appearance.” Russel reiterated his earlier arguments that any number of possibilities—McCormick’s alcoholism, his symptoms, or the drugs used to treat him—could have contributed to the morbid appearances, as opposed to an alleged distinctive pathological action of “rabific poison.” Finally,

the long record of inconclusive autopsies further reinforced Russel's confidence in the verdict of the coroner's jury.⁵⁰

Abraham Jacobi delivered an equally hard-hitting response that disputed Hammond's claim to specialized expertise in histological matters from the perspective of a medical eminence steeped in the full panoply of Virchow's medical program. The Prussian-born Jacobi already possessed an enviable reputation for his role in developing pediatrics as a medical specialty, and by the end of the century he would be known as the founder of the field, as well as one of the most important physicians in the political world of urban progressive reform. As a young man, Jacobi had started his medical training during the tumultuous revolution of 1848, and terms in prison for a total of two years for his activities in the Communist League followed the completion of his medical studies. Once released, he headed for the relative political safety of England, but in October 1853, after several months of failed efforts to establish a medical practice, he moved on to the United States and soon settled in New York City.⁵¹

Jacobi's career fully reflected the confluence of medical science and politics that defined Rudolf Virchow's commitment to social medicine, and not just the laboratory-based cellular pathology that Hammond sought to emulate. Jacobi's medical education included a stint at Göttingen and exposure to the cutting edge (so to speak) of pathological anatomy, as well as immersion in Virchow's social vision. During the 1850s, amid the visible suffering in the tenements of Kleindeutschland on the Lower East Side, Jacobi and the rest of the German émigré community of radical physicians in New York City had ample opportunity to pursue Virchow's combined political and medical agenda. Jacobi also built ties to like-minded reformers beyond émigré circles, and his efforts to meld German pathology with advances in therapeutics for childhood illnesses earned recognition and academic appointments. Jacobi joined the faculty of New York Medical College in 1860, moved to the University of the City of New York five years later, and then became a professor at the College of Physicians and Surgeons in 1870. His avid participation in the associational life of New York medicine, including his active membership in the New York Pathological Society and the New York Academy of Medicine, also gave Jacobi a platform for promoting social reform through medicine and through the fight against environmental sources of childhood disease.⁵²

As the indignant Hammond pointed out, Jacobi's prominence in New York medical circles did not necessarily make him an expert on histology.



Abraham Jacobi, ca. 1875. Courtesy of the US National Library of Medicine.

Although concerns with medical chemistry, pathological anatomy, or other advancements rooted in mid-nineteenth-century laboratory medicine were not absent from Jacobi's work, his professional priorities and interests revolved around the effort to unify clinical medicine and public health as the basis of pediatrics. To that extent, one can perhaps sympathize somewhat with Hammond's contention that Jacobi lacked the professional standing to critique his laboratory methods. At the same time, however, Russel correctly identified Jacobi's analytical thoroughness and his exacting ability to bring the existing medical literature to bear on new scientific claims.⁵³

At any rate, Jacobi had no patience with Hammond's snide tirade, and he responded with equal parts of sarcasm and medical acuity. Jacobi declared that he could answer "the pompous dignity of offended innocence and the modest self-assurance of an unassailable oracle" who questioned the jury's

competence only by citing Hammond's own admission at the inquest that exposure of the tissue samples to alcohol could have produced the pathological appearances that he had observed. Like Russel, Jacobi also appealed to the authority of proper histological techniques. Pulling no punches, he added that anyone who consulted the appropriate treatises would "find that Dr. Hammond happens to misquote his authorities, and misstate their methods."⁵⁴ Then, having made a mockery of Hammond's histological work, Jacobi also disparaged his professional conduct and character by attacking his unsavory courting of public opinion and indulgence in a "spirit of a narrow-minded nativism." Jacobi concluded with a final jab in which he described his adversary's response to insult with a parody of late-nineteenth-century neurophysiology: "His offended sensitiveness excited his vaso-motor nerves, and stimulated the vessels of his gray substance into anomalous circulation, and his cerebral cells into emotional hyperaesthesia—and he rashly rushed into publicity."⁵⁵

Although Jacobi found fault in Hammond's propensity for cultivating the press, no one targeted him on ethical grounds more directly or forcefully than *Medical Record* editor George F. Shrady. In mid-September, after Hammond launched his libel suit, Shrady held his ground and reiterated his allegations. He clarified, "That I do charge [Hammond] with unethical conduct is true, and this charge is principally based upon the manner in which he allowed himself, as a professional man, to be paraded before the public in the columns of the *New York Tribune*." Shrady also collected and published letters from Russel, Bellevue curator J. W. S. Arnold, Coroner Henry Woltman, and Bellevue physician A. W. Knox, which backed up his accusations that Hammond had monopolized materials from McCormick's body, and that he had improperly pushed his way into the Entwistle autopsy and attempted to keep those tissue samples for himself as well. Shrady acknowledged just one error in his original report and admitted Hammond had ultimately handed over all of the samples from the Entwistle autopsy to Arnold, and not just "two or three thin slices."⁵⁶ But that was his only concession in an otherwise scathing response to Hammond's protestations against the *Medical Record*.

After October, the brouhaha over Hammond and the McCormick case dissipated, and Hammond's withdrawal of the libel suit several years later brought the incident to an anticlimactic close. This incident in New York medical history, with its blend of strong-willed physicians, media hype, and pathological undertaking, reflected the strength of physicians' commitment to anatomical explanation and the passions that it aroused. The McCormick

autopsy also brought together the city's medical leadership in a highly visible setting, in which the coroner's broad mandate and the elite physicians' clash under a watchful public eye symbolized both the social stature of medicine and practitioners' struggle to define the limits of professional propriety as they hashed out the physiological dimensions of hydrophobia. Over the longer term, Hammond refused to yield any intellectual ground to the critiques from Shrady or the majority in the coroner's jury. In subsequent years, he continued to depict his 1874 findings as an important development in the pathological analysis of rabies, and he carefully avoided mentioning any of the earlier challenges to his sample preparation techniques and questions about his professional conduct.⁵⁷ The broader medical community, however, never accepted the validity of Hammond's claims, and, ultimately, they faded into the long record of failed rabies autopsies. But the hunt for a definitive anatomical marker of hydrophobia continued.

Pathological Anatomy, Neurology, and the Challenges of Germ Theory: Pasteur and His Critics

Although Hammond's 1874 bid for histological posterity fell short, anatomical investigation and the search for lesions continued to shape medical knowledge and practice even as the germ and the grand narrative of microbial advancement became increasingly dominant in popular medical discourse in the last third of the nineteenth century. In the 1860s and 1870s, germ theory defined an emerging frontier of scientific and medical possibility, in which the disease-causing capacities of specific microorganisms explained the infectious conditions that sanitary reformers had previously associated with generalized filth and dangerous miasmas. From this new milieu of bacteriology came one of its signal achievements: in October 1885, the renowned French scientist Louis Pasteur announced to the French Academy of Sciences his laboratory's dramatic development of preventive rabies vaccination, in which a series of inoculations with attenuated virus allowed humans bitten by rabid animals to build immunity during the interim between initial exposure and the onset of disease. Pasteur's breakthrough generated worldwide scientific and media attention, and within months, patients and visitors from around the world streamed to Pasteur's Paris laboratory. Victims of dangerous animal bites undertook inoculation against rabies, and physicians sought to witness and evaluate the new vaccination technique. Chapter 5 examines the institutionalization of rabies vaccination in New York City and the transformative aspects of Pasteur's innovation in detail. Here I emphasize

the continuities at work that persisted alongside such developments, particularly the enduring significance of anatomical expectations as an authoritative analytical framework, even as germ theory proclaimed the beginning of a new medical era.⁵⁸ In particular, neurology evolved as a stronghold of somatic conceptions of disease causation, and from American neurologists' ranks emerged a forceful critique of the Pasteurian approach to hydrophobia, one that made perfect sense from the standpoint of the anatomical tradition.

Historians of medicine have shown that contrary to earlier accounts, germ theory quickly won over American physicians, and relatively few skeptics remained by the 1880s. If anything, physicians adopted the germ with too much enthusiasm, which famously led Abraham Jacobi in 1884 to caution against the "bacteriomania" that greeted every report of bacteriological discovery, no matter how dubious.⁵⁹ Much as partisans of microscopy and histology saw new lesions too easily with every shadow or untoward stain, devotees of the germ absorbed shaky announcements of novel bacteriological findings all too credulously. The doubters, for their part, have not fared well historically, but their objections made sense from the perspective of nineteenth-century pathological anatomy. Pasteur's keen ability to derive conclusions about disease and its control by manipulating microbial solutions left far too much unsaid for those physicians who still insisted on anatomical understanding as the basis of medical science, and who expected explanations to rely on minute visual inspection of the structures of the body. The elegance of Pasteur's experimentally backed reasoning easily persuaded sanitarians accustomed to thinking in terms of malign miasmas and fomites that spread infection. Treatises on hydrophobia had also long viewed the disease as transmitted primarily by some kind of poison in the mad dog's saliva, which dovetailed easily with Pasteurian arguments for medical practitioners eager to embrace the bold promise of the bacteriological laboratory.

For physicians who equated proof with visualizable physiological processes, however, Pasteur's lack of formal medical training, combined with the seemingly speculative nature of his arguments and his lack of insight into how an as-yet-unidentified microbe of rabies ravaged the body so thoroughly, raised real qualms and even hints of quackery. As Neil Pemberton and Michael Worboys have indicated in their study of rabies in Britain, in a nineteenth-century era of enthusiasm for a seemingly endless series of purported rabies remedies, some medical observers instinctively perceived Pasteur's injections as the latest version of snake oil.⁶⁰ Similar reservations appeared on the other side of the Atlantic. In November 1885, for example, George F. Shrady

objected to what he saw as the artifice of Pasteurian rabies vaccination: “Pasteur’s process, by which he prepares his virus and his subjects, is a very complicated one, and reads more like the performance of a conjurer than the methods of a scientist.” Within a few years, Shrady came to accept Pasteur’s findings, but his initial reaction exemplified the reaction of a surgeon and pathologist who preferred concrete, anatomical evidence discernable to the human eye to inferences drawn from laboratory preparations and their introduction into animal and human bodies.⁶¹

Critiques of rabies vaccination from some of the most prominent American neurologists also underscored the gap between detractors’ insistence that attribution of disease causation required visible evidence of abnormality in bodily structures and the general absence of such considerations in Pasteurian science. The Hammond affair of 1874 indicated the strength of the anatomical expectations that undergirded neurology’s emergence. During the postbellum years, leading American neurologists, including several eminent New Yorkers—Hammond, Edward C. Spitzka, George Miller Beard, and S. Weir Mitchell—drew from a variety of sources to uphold their materialist, physiologically rooted understanding of nervous disorders. For them, powerful forms of legitimation came from German physiologist Emil du Bois-Reymond’s identification of the nerve action potential and other important aspects of the electrophysiology of the nervous system from the 1840s onward, combined with the pioneering pathophysiological studies of French anatomist Jean-Martin Charcot, now known as “the father of neurology,” who characterized specific lesions associated with multiple sclerosis, amyotrophic lateral sclerosis, and other neurological conditions in the 1860s. Experimental physiologists and neurologists also sought to connect mental and bodily phenomena in the rapidly expanding field of psychophysics, which attempted to identify the precise anatomical pathways by which normal and aberrant forms of thought, emotion, and imagination gained expression in the vascular and nervous systems. By searching for lesions and attempting to articulate the exact physiological foundations of disease, late nineteenth-century neurology simultaneously reinforced its roots in the anatomical tradition while also identifying mechanistic forms of explanation with the forefront of medical progress.⁶²

From a strict nineteenth-century American neurological standpoint, germ-based approaches to hydrophobia fell short in two fundamental respects. First, they failed even to identify an infectious agent, much less show how it devastated the nervous system.⁶³ By contrast, the neurologist critics of Pas-

teurian science found in somatic explanations, premised on physical damage to the nervous system, a more satisfying set of explanations for the disease and its symptoms. Second, the prevalence of false cases of hydrophobia, in which worry and nervousness seemed to manufacture extreme, and even fatal, symptoms, validated neurologists' claims to understand mind-body problems and the physiological results of mental states. Neurologists rarely acknowledged the extent to which their own proposed disease mechanisms remained highly speculative, but according to their reckoning, they at least had ideas about how irritation from an animal bite might wreak havoc on the nervous system, or how psychophysical phenomena linked imagination and emotion to various physiological processes of the nervous and vascular systems that were amenable to close examination and study. Germ theory, by contrast, offered vaccination, but without providing sufficient causal explanations about the mechanisms by which a putative hydrophobia germ produced such ruinous effects in the human body.

In the last third of the nineteenth century, false hydrophobia cases went from being an interesting oddity to a recognized nervous condition. During the middle decades of the century, treatises, commentaries, and news stories frequently reminded readers that a distinct portion of physicians doubted the very existence of hydrophobia as a specific disease and instead thought it merely a variant of tetanus or the product of the imagination run wild.⁶⁴ This precautionary refrain let New Yorkers know that as much as they feared mad dogs, they also needed to keep their anxieties in check, lest they fall victim to their own sense of fright. Even as the medical literature recognized the possibility of false cases, however, it emphasized the harsh realities of hydrophobia. Physicians regularly pointed out that hydrophobia deaths among young children or animals unable to appreciate complex predicaments proved that the disease could not be solely the product of nervous anticipation and fright.⁶⁵ In light of the disease's harsh reality, hydrophobia cases induced by the psyche constituted more a diagnostic curiosity than an interesting and important medical phenomenon in its own right. For example, Hammond, in his 1871 treatise, acknowledged that the "protean disease, hysteria, occasionally puts on the semblance of hydrophobia," and "that the hysterical counterpart has several times been regarded as the real disease."⁶⁶ These observations were but a minor point, however, in a chapter devoted to outlining the natural history, symptoms, morbid appearances, and treatment options for hydrophobia.⁶⁷ In accordance with common beliefs about the effects the mind could exert on the body, medical and veterinary authorities generally agreed

that recipients of dangerous dog bites needed to maintain a positive outlook and avoid the stresses that might increase their likelihood of developing symptomatic rabies.⁶⁸ Cases derived purely from the imagination, however, constituted no more than a form of hysteria or other nervous fright and did not merit prolonged consideration.

This medical consensus began to shift in the mid-1870s, as prominent American neurologists and other physicians, particularly in the medical centers of New York and Philadelphia, launched a series of intense and ever-more vocal discussions of imagined hydrophobia cases. Against the cultural backwash of growing concerns about neurasthenia, hysteria, mania, insanity, and other mental afflictions that seemed to reflect the ever-more taxing nature of life in a rapidly urbanizing and industrializing society, medical professionals increasingly conceived of fright-induced hydrophobia as a distinct disease condition that posed a growing public health risk. In New York City, the aftermath of the McCormick autopsy and the general media frenzy over hydrophobia in the summer of 1874 trained a spotlight on the power of fear to induce hydrophobia. During the ensuing debate over whether Roderick T. Entwistle had died from genuine hydrophobia or the combined effects of imagination and fright, members of the New York Neurological Society also cited rising rates of nervous diseases.⁶⁹ In August, city papers closely followed the travails of policeman Thomas Barrett, whose exaggerated symptoms of wild barking and howling quickly led to a diagnosis of hysteria and false hydrophobia.⁷⁰ Years later, Hammond recalled vividly how he had effected Barrett's cure by sternly commanding him to drink water: "My tone and action had diverted his mind from himself, and had set up a train of thought altogether different from that to which he had previously been subject."⁷¹

After the immediate brouhaha surrounding the 1874 rabies scare died down, cases of illness and death attributed to imagined hydrophobia continued to attract notice. Stories about persons afflicted with fear-induced rabies or suspected hydrophobia cases ultimately diagnosed as tetanus, epilepsy, meningitis, alcoholism, insanity, or other conditions became a news staple and peppered the pages of New York's dailies throughout the last third of the nineteenth century.⁷² In 1877, for example, New York newspapers and medical journals paid particularly close attention to the death of Professor Victor Alvergnat, a French teacher in Hartford, Connecticut, whose attending physicians differed sharply on whether he had died from hydrophobia or hysteria.⁷³ The dispute followed on the heels of three suspicious deaths in

New York City that local physicians attributed to various forms of “nervous excitement” rather than hydrophobia, even though two of the victims had been bitten by the same cat, along with “a horse, the cat’s third victim,” which a veterinarian determined died from hydrophobia.⁷⁴ By the 1880s, a new set of medical labels—lyssophobia (alternatively spelled as lyssaphobia), pseudo-hydrophobia, simulated hydrophobia, spurious hydrophobia, and false hydrophobia—provided terminology to describe the power of the mind to transform ordinary animal bites into mortal wounds. Toward the end of the century, medical textbooks also enshrined pseudo-hydrophobia into the pantheon of recognized nervous conditions.⁷⁵

Amid this flurry of reportage, driven by late nineteenth-century cultural and medical obsessions with nervous conditions, distinguished neurologists Charles K. Mills of Philadelphia and Edward C. Spitzka of New York fervently articulated the case for hydrophobia as predominantly, if not exclusively, a disease of the imagination. Mills helped to spark serious and systematic interest in pseudo-hydrophobia in May 1880, when he reported on a hydrophobia case to the Philadelphia County Medical Society. There Mills offered a more strident version of Hammond’s earlier theory that hydrophobia could sometimes result from a peripheral nerve irritation following the bite of a nonrabid dog. Contrary to “the commonly accepted view” of hydrophobia as “a disease produced only by the implantation of a specific virus,” Mills declared, in an exaggerated misreading of Hammond’s position, “that it is perfectly possible that it may be a nerve disease from the beginning.” He then outlined a possible physiological mechanism by which the bite alone could produce tetanus-like symptoms akin to hydrophobia. He explained, “Just as in traumatic tetanus and reflex epilepsy, so in so-called hydrophobia, the irritation caused by a peripheral nerve wound is conveyed by afferent fibres to spinal and medullary centres, and there induces molecular and vascular changes, which lead to the well-known spasmodic and other manifestations.”⁷⁶ The invocation of an ill-defined “irritation” and unknown “molecular and vascular changes” suggested the lacunae that plagued neurology, despite the field’s commitment to exacting physiological explanation. The references to transmission of injury through nerve fibers and the structures of the brain, however, suggested neurologists’ dedication to anatomically based models of disease causation, with the gaps to be filled in by further research.

Ten years later, Mills persisted in his insistence on neurological explanation over germ theory as the cause of hydrophobia. In 1890, in light of “the

tide towards nervous hydrophobia,” Mills and a close colleague described two simulated instances of the condition before the Philadelphia Neurological Society. Although both patients had a history of dog bite, the two physicians argued that the symptoms did not entirely match those of true rabies, and that, as Mills explained, “both cases could be much more readily explained by the supposition of a localized gross organic lesion.”⁷⁷ In the ensuing discussion, other neurologists questioned Mills’s grander conclusions, but they readily acknowledged the ease with which physicians confused mental disorders with genuine rabies. James Hendrie Lloyd cautioned against assuming that true hydrophobia did not exist or that simulated cases could end in death, but he agreed that “many reported cases have been badly observed, and have been cases really of delirium or maniacal excitement.” G. Betton Massey commented on a recent case under his care, in which the ongoing, intermittent symptoms showed clearly that his patient did not suffer from true hydrophobia, but “if this individual had died early, it would probably have furnished food for the newspapers” as a frightful death from the bite of a rabid dog. Mills agreed on the problem of the press: “All the cases reported in the newspapers are sensational. . . . Nineteen out of every twenty cases of so-called hydrophobia are undoubtedly not instances of this disease. There is a hydropho-hydrophobia which is the result of these reports.”⁷⁸

Leading New York neurologist Edward C. Spitzka delivered a like-minded attack that excoriated media-driven panics and explicitly disputed Pasteurian preventative measures. As a founder and active member of the New York Neurological Society, a faculty member of the New York Post-Graduate Medical School, and the author of multiple studies on the anatomy of the brain as well as a treatise on insanity, Spitzka was a well-established figure within the New York medical elite, and he gained national notoriety for his expert testimony at the trial of Charles Guiteau. He was also, as Charles Rosenberg once noted, “a painstaking neuroanatomist,” and he did not shy away from challenging work that he found shoddy or wrongheaded.⁷⁹ In mid-1886, Spitzka responded to the excitement surrounding Pasteur with an extensive analysis of false hydrophobia and its dangers. Spitzka attributed several recent deaths in New York City to lyssophobia, which, in light of the extremely low incidence of genuine hydrophobia, made the false form of the disease even more dangerous than its true version, assuming that the latter even existed. A veritable epidemic of “journalistic hydrophobia” whipped up by an overeager press and the hype surrounding Pasteurian rabies vaccination, Spitzka argued, spread panic among the public, which left dog bite victims vulnerable

to scaring themselves into manifesting symptoms. Under these conditions, even strong-willed, “calm and courageous persons” could not always escape the ill effects of “expectant attention.” Spitzka described multiple cases that illustrated the ability of the mind to generate full-blown rabies symptoms, and he estimated that perhaps a hundred or more people in the United States and Europe had died from simulated cases induced by the overwrought enthusiasm surrounding Pasteur. Finally, Spitzka summarized his own experiments, designed to challenge Pasteur’s experimentally derived conclusions by demonstrating basic physical mechanisms that could induce neurological pathology, in which he caused dogs to develop hydrophobia-like symptoms by introducing various “non-rabic foreign substances” to their brains. For Spitzka, these results indicated that alleged hydrophobia was no more than a generic form of neurological disturbance, and that it was certainly not a specific disease caused by a unique disease agent. “Mere terror and expectant attention,” he concluded, “are the chief factors in the spread of the disease,” the “terror-psychosis, known as lyssophobia.”⁸⁰

Spitzka’s arguments and experimental findings enjoyed a well-publicized hearing in New York’s daily press, amid reports of local physicians’ conclusion that Brooklyn builder Jacob Hertline had died horrifically from false hydrophobia and not the genuine form of the disease.⁸¹ Spitzka’s work, along with the critiques of Mills, Philadelphia physician Charles W. Dulles, and other medical experts, made pseudo-hydrophobia and its presumed physiological workings into a going concern among lay observers and physicians alike. In accordance with the long-established anatomical tradition, lesions and other disruptions of the normal functioning of the nervous system weighed heavily in discussions. As the *Tribune* informed its readers, Spitzka’s laboratory results supported the idea “that certain lesions of the brain may result in such nervous derangement as to produce disease-counterfeits of the kind so commonly encountered in hysteria.”⁸² New York physicians also aired their perspectives through interviews with reporters or letters to the editor. As the veterinary surgeon James Hamil told the *New York Times*, Spitzka’s experiments raised serious doubts about hydrophobia’s disease specificity. “What we have been accustomed to call hydrophobia,” he observed, “is, in my opinion, nothing but irritation of the nervous system.”⁸³ Early in 1887, “A Physician” reminded the *Brooklyn Daily Eagle* that unusually long incubation periods indicated that the suffering patient “is not suffering from genuine rabies, but from a disordered and over excited nervous condition.”⁸⁴ William A. Hammond also joined the public discussion of pseudo-hydrophobia. When asked

his thoughts on the matter by the *New York Herald* in January 1886, he opined that false cases caused more deaths than instances of true hydrophobia. He followed up several years later with an article in the *North American Review* that reframed his old treatise chapter to focus on the mind's ability to manufacture simulated hydrophobia.⁸⁵ Similar commentaries by other physicians continued to appear in daily newspapers and popular magazines until well into the twentieth century.

All of this is not to say that neurologists necessarily rejected Pasteurism. For example, elite New York neurologist S. Weir Mitchell, best known for the rest cure and the gender-laden nature of his ideas about nervous disease, as well as Philadelphia-based neurological surgeon William Williams Keen, yet another prominent physician who came up the medical ranks through army service during the Civil War, both readily adopted germ theory, as did countless physicians raised in the anatomical tradition.⁸⁶ Whether neurologists as a group were more likely than other physicians to challenge germ theories of disease in their various forms awaits another study. The noteworthy point here is that the American-based skeptics of germ-based explanations for hydrophobia included some of the most eminent neurologists in the nation, and their insistence on somatic explanations rooted in well-defined physiological mechanisms provided an understandable basis for their doubts. In addition to Mills's and Spitzka's outright attacks, Hammond pronounced himself "agnostic" about Pasteurian rabies vaccination at a meeting of the Post-Graduate Medical School's Clinical Society in January 1886. Despite Hammond's enthusiasm for chemistry and microscopy, his sanitarian leanings during the Civil War, and his wide-ranging medical interests, he appears to have said relatively little about germ theory during his long career. His comment about Pasteur's rabies work apparently reflected a mistaken belief that the French scientist derived his infectious material from blood samples, when rabies was a disease of the nervous system.⁸⁷ Hammond's unwillingness to hop immediately onto the Pasteurian bandwagon, however, also indicates how a conception of medical science premised on understanding disease through minute inspection of the structures of the body could easily militate against acceptance of bacteriological findings. Just as existing ideas about dangerous miasmas and infectious fomites paved the way for sanitarians' quick acceptance of germ theory, neurology's foundational axioms put up obstacles. For neurologists such as Mills, Spitzka, and Hammond, commitments to anatomy and physiology offered ample reasons for skepticism about Pasteurian science, as well as alternative means for making sense of hydrophobia.

Looking Backward, Moving Forward: Histology, Diagnosis, and the Lesion in the Twentieth Century

Although anatomical commitments spurred attacks on germ-based explanations for hydrophobia, conversely, Pasteurian rabies vaccination stimulated the continued search for definitive anatomical markers of the disease by adding a new sense of urgency to the problem of diagnosis. Pasteur developed a reliable diagnostic method that used postmortem samples derived from the spinal cord of a suspected rabid animal or human hydrophobia victim to infect rabbits or other small animals via trephination. This important innovation required a waiting period of fifteen to twenty days for results, however, which was impractical for human animal bite victims anxious to know whether to undertake vaccination. Without a rapid and accurate method of diagnosis, animal bite victims faced a fraught choice of either risking the delay of days or weeks to see if a test rabbit or guinea pig inoculated with biological material from a suspect animal developed rabies, or beginning the lengthy and painful course of injections to build immunity immediately, whether or not it was truly necessary. Beyond this pragmatic issue, Pasteur's diagnostic test also failed to satisfy critics' more basic scientific and medical desire to understand the fundamental nature of hydrophobia through its specific physiological manifestations. The hope for the discovery of a distinctive anatomical marker of rabies remained as strong as ever.

By the turn of the century, histological analyses seemed ever-closer to fulfilling the age-old promise of pathological anatomy to reveal the unique physiological traces of the disease. As early as 1892, the prominent Romanian pathologist Victor Babes identified a cellular structure in dogs that appeared to have some diagnostic value, even though the abnormal nodules he observed were not unique to hydrophobia and not always present in rabies cases. Eight years later, noted Belgian anatomist Arthur van Gehuchten and one of his students, Charles Nelis, described highly specific lesions in the ganglia of the cerebrospinal system common in rabid animals, although the difficulty of dissection of the particular brain and spinal tissues involved, as well as their absence in the early stages of disease, rendered them impractical for diagnosis. In subsequent decades, American medical experts regularly cited both findings as they evaluated the state of the art and continued their own research efforts.⁸⁸

The key breakthrough came in 1903, with Italian pathologist and bacteriologist Adelchi Negri's identification of what became known as Negri bodies,

cellular inclusions that became visible under the microscope in samples of brain tissue from rabid dogs and rabbits upon the use of particular staining methods. Negri achieved a high degree of diagnostic accuracy, and later reviews backed up his claim. In 1905, for example, Daniel W. Poor at the Research Laboratory of the New York City Department of Health compiled figures from six European laboratories and found no false positives in 355 confirmed rabies cases, and just eleven false negatives in which Negri bodies were absent, a level of accuracy that compared favorably with existing laboratory methods for diagnosing tuberculosis and diphtheria.⁸⁹ Finally, it seemed, medical science had discovered the distinctive physiological marker that rabies left on the body, and histological methods had fulfilled the mandate of the French pathological tradition and its search for lesions.

Meanwhile at the Research Laboratory, which was one of the most prominent American institutions for bacteriological research, Anna Wessels Williams and her colleagues were also investigating cellular inclusions associated with smallpox, vaccinia, and other conditions. Williams narrowly missed the priority claim on the discovery of the Negri bodies, but she and her staff soon succeeded in building on Negri's work, refining the necessary histological procedures, and developing new methods for the rapid diagnosis of rabies.⁹⁰ A fuller account of the Research Laboratory and its institutional significance in the history of rabies and public health appears in the following chapter. For now, it is sufficient to recognize the laboratory's diagnostic achievement. Williams discovered that a smear method for taking samples yielded greater clarity in cellular appearances without the more elaborate and time-consuming preparations needed for thin sections. Diagnosis now required just a couple of hours at most, rather than the two to three days that sectioning frequently took. Furthermore, the smear method was not only more reliable, but also so simple that, according to one of Williams's staff members, "any one even unskilled in laboratory technique" could learn the procedure after just one or two attempts.⁹¹ One commentator identified an additional advantage of the new histological test, namely, that it might spare laboratories from the "disgusting" necessity of keeping a "constant assortment of rabid animals."⁹² A subsequent study by Williams of more than two hundred naturally occurring cases of rabies—so-called street rabies—underscored the accuracy of the smear method. She found the test completely reliable for 185 samples where the brain tissue arrived at the laboratory in good shape and the staining showed clear, well-resolved Negri bodies. Fifty-nine samples with "absolutely no suspicious bodies" proved negative for rabies when tested by animal

inoculation. Of twelve brains that arrived “too decomposed to show anything” upon histological examination, four tested positive through animal inoculation, while of four samples that displayed suspicious but not definitive inclusions, two tested positive and two negative.⁹³ The deadliness of rabies meant that ambiguous negative results, although infrequent, mandated the old method of inoculating a test animal as a backup. Positive findings, however, gave patients the confidence to submit themselves immediately to the vaccination process.

The smear method became the basis of standard diagnostic tests until the rise of fluorescent antibody tests in the 1960s, and it added a final flourish to the triumphant discovery of the Negri bodies and their resolution to the decades-long search for the lesion of rabies. But did the Negri body really constitute such a lesion? Even this seemingly solid finding gradually came apart. First of all, observers in the early twentieth century agreed that the Negri bodies had strong diagnostic value, but they disagreed over what they actually were. Negri himself thought they were protozoa and the actual infectious agent that caused rabies. At a time when many researchers postulated that inclusion bodies were of protozoon origin, a considerable proportion of early investigators shared Negri’s assessment, including Williams, who argued at length that the morphology of the Negri bodies indicated their protozoon nature. Daniel W. Poor leaned more toward seeing the Negri bodies as evidence of pathological derangements than as invading organisms, although he remained open to either possibility. As the Harvard veterinary pathologist Langdon Frothingham noted, whatever the case, the Negri bodies offered a powerful diagnostic tool.⁹⁴ But from the standpoint of disease pathology, in the early 1900s, whether Negri bodies represented the characteristic lesion of rabies or the actual infectious agent remained an open question, one symbolic of scientific change and the demands that bacteriology placed on older traditions in pathological anatomy and cellular pathology. The problem was far from trivial—scientists discarded the protozoa theory by the mid-twentieth century, but they continued to debate whether the Negri bodies reflected cellular damage or contained the actual rabies virus.⁹⁵

Moreover, faith in the diagnostic value of the Negri body test declined over time. In 1913, Lina Negri-Luzzani, Negri’s wife and collaborator, analyzed ten years’ worth of data and established the presence of Negri bodies in about 90 percent of rabies cases, a figure lower than what the earliest research suggested, but still a respectable rate of accuracy for diagnostic purposes. Studies in the mid-1950s and 1960s, however, reduced this figure

to 75 percent, and it has fallen still further since then. Today, according to the US Centers for Disease Control and Prevention, Negri bodies appear in only half of clinically confirmed cases of animal rabies, and visually indistinguishable structures sometimes appear in the absence of rabies infection.⁹⁶ Moreover, even to the extent that Negri bodies are indicative of rabies, they remain problematic as lesions in the classic sense of nineteenth-century French pathological anatomy, with its guiding principle of correlating morbid appearances with symptoms. As one late twentieth-century review essay noted, in rabies, “the paucity of histological lesions . . . contrasts with the dramatic behavioral disturbances and lethal nature of the disease.”⁹⁷ That comment underscores both the persistence of old ideas about how disease pathology ought to manifest itself physically in the body and the ways in which rabies continues to confound those expectations. The mismatch between extremity of symptoms and modesty in cellular appearances still possesses the ability to surprise and perplex, two centuries removed from the origins of the Paris school.

A Tale of Three Laboratories

Rabies Vaccination and the Pasteurization of New York City

In the midst of New York physicians' decades-long reckonings with the anatomical tradition came Pasteurian rabies vaccination, one of the signature achievements that made germ theory the foremost symbol of medical advancement in the late nineteenth century. The procedure had its medical critics, but their objections gained little traction amid the wildly enthusiastic accolades that greeted word of Pasteur's famous discovery in the fall of 1885. In the United States, the saga of the Newark boys—the December 1885 journey of four working-class New Jersey children to Paris to undergo Pasteur treatment following bites from an alleged mad dog—captivated Americans. Gripping accounts of the boys' medical adventure and rescue from mortal peril, as Bert Hansen has written, transformed the news of Pasteurian rabies vaccination from ordinary scientific advance to breakthrough discovery and public sensation in the United States during the winter of 1885–86.¹ Preventive hydrophobia treatment consequently became the foremost symbol of the powerful possibilities of germ theory and the bacteriological laboratory. Although clinical cases of rabies remained incurable and hopeless, vaccination promised a new era of control, in which prompt action could virtually eliminate the toll of human suffering and death from a dread disease.

Rabies vaccination sealed Pasteur's reputation and propelled the institutional expansion of Pasteurian science throughout the French Empire. Meanwhile, as Pasteur's closest students and associates established new outposts of the Paris laboratory elsewhere in France or in French colonial possessions, visitors to Pasteur's Paris facilities learned the technique for producing vaccine and disseminated preventive hydrophobia treatment more widely around the world. Already in 1887, barely two years after Pasteur's initial announcement, at least fourteen centers in far-flung locations, including Russia, the

United States, Brazil, and Mexico, administered rabies vaccination at institutes named for Pasteur but not officially associated with his Paris laboratory.² In the United States, New York City pioneered the introduction of Pasteur's rabies vaccination regimen, first through the creation of the short-lived American Pasteur Institute (API) in 1886, and then via the New York Pasteur Institute (NYPI) founded in 1890. At the turn of the century, the New York City Department of Health (NYCDH) also entered the field, and it eventually succeeded the NYPI as the city's, and the region's, dominant provider of rabies vaccination.

The history of these three New York institutions and their successive roles in producing and administering preventive hydrophobia treatment highlights larger problems of knowledge transfer, the multiple and shifting roles of the nineteenth-century laboratory, the competing economic and institutional contexts of public health provision, and the interplay between animal bodies and the social and institutional dimensions of rabies vaccination in the late nineteenth-century American city. Scholars still know relatively little about how Pasteurian therapeutic practices and laboratory techniques spread outside of the Paris-centered network of Pasteur institutes. The New York history of Pasteurian rabies vaccination underscores the significance of institutional settings and their associated political economies in shaping the reception of preventive hydrophobia treatment in the United States. The successful introduction of Pasteur's technique and procedure depended not just on bacteriological knowledge, laboratory skills, and the ability to manipulate animals biologically, but on the forms of entrepreneurship associated with the emerging corporate pharmaceutical enterprises of the late nineteenth century. Institutional stability, however, proved elusive within the shifting circumstances of philanthropy, corporate ventures, and public health at the turn of the century. Ultimately, historical contingency, institutional competition, and a changed regulatory environment shifted the balance of power over rabies vaccination in favor of the NYCDH's Research Laboratory, which eventually led the NYPI to close its doors.

Before I detail this history of laboratories and their social contexts in New York City between 1886 and 1918, some caveats about terminology are in order. The rabies vaccination procedure that Pasteur developed was prophylactic and not curative in nature, but because it required a long series of injections over a two-to-three-week period, contemporary observers often referred to it colloquially as a treatment. Common terms for rabies vaccination

included “Pasteur treatment” or the Department of Health’s “preventive hydrophobia treatment,” and I employ those expressions interchangeably with “rabies vaccination” and other present-day usages. Recall also the vagueness at the turn of the century surrounding the presumed “rabies virus,” which remained a still-unidentified “microbe” or “germ,” one so minute that it passed through the finest of laboratory filters. As discussed in the previous chapter, Pasteur treatment’s reliance on experimental inference over direct identification of the disease agent fueled medical skeptics’ arguments and left openings for neurologically based alternatives. While physicians continued to debate the fine points of etiology, however, preventive hydrophobia treatment became firmly established within the institutional landscape of medicine and public health in New York City.

Thwarted Expectations: The Rise and Fall of the American Pasteur Institute

New Yorkers eagerly followed the news of Pasteur’s historic 1885 announcement, and the *New York Herald’s* subsequent subscription drive to send the Newark boys to Paris gave them a tangible sense of investment in this latest medical advance. As the Newark group embarked on its Parisian sojourn, New York-area physicians and other interested parties began to call for the establishment of an American facility that could provide Pasteur treatment.³ Reports about the circulation of biological materials and knowledge of techniques that accompanied the flow of patients and medical professionals in and out of Paris further inflated expectations about the forthcoming availability of rabies vaccination in the United States. As the *New York Times* breathlessly related, Dr. Frank S. Billings, the veterinary expert who escorted the Newark boys, departed from Paris “one of the happiest men that ever sailed,” because “he carries home several boxes of scientific instruments, [and] numerous vials of virus of several kinds.” Although Billings “could not take rabies virus because it will only keep four or five days,” the paper assured readers that “he knows how to prepare it.” The *Brooklyn Daily Eagle* similarly predicted with complete confidence that Billings “will doubtless be able to proceed according to the Pasteur method,” and only the need to raise funds stood in the way of creating an American facility to provide rabies vaccination.⁴ Both stories were inaccurate—although Pasteur treated foreign patients, he did not receive visitors for purposes of detailed observation and dissemination of his techniques for prophylactic rabies inoculation until several

months later, and Billings never attempted rabies vaccination in the United States. Such newspaper coverage, however, exemplified the sense of anticipation and excitement surrounding the Newark boys' story.

Indeed, although the newspapers erred in their reports about Billings, a group led by two prominent New York physicians, Alexander B. Mott and his son, Valentine Mott, quickly mobilized to bring Pasteur treatment to the United States. The Motts represented an exalted medical lineage that granted them stature and visibility in New York City's medical and social circles. Valentine Mott was named after his grandfather, the pioneering vascular surgeon and a leading figure in American medicine both locally and nationally. Although neither son nor grandson achieved the eminence of their illustrious progenitor, Alexander Mott earned a respected reputation as a surgeon. He helped to found Bellevue Medical College, and he joined Bellevue's founding faculty. In July 1874, he participated in the postmortem analysis of William McGuinniss, a 7-year-old boy who died from hydrophobia, and perhaps that experience informed his interest in Pasteurian rabies vaccination. His son Valentine embarked upon a career as a surgeon in 1879, when he joined Bellevue as an attending physician; at the time of his death in 1918, he was best known for his attempt to bring Pasteur treatment to New York City.⁵

The Motts launched their effort in January 1886, when they led eight New Yorkers from the city's overlapping medical, theatrical, and francophone social circles in filing a certificate of incorporation for an American Pasteur Institute.⁶ Newspapers as far away as Idaho and California took note of the new institute's creation.⁷ The Motts's associates included the French-born and -trained paragon of American veterinary medicine Alexandre Liautard; Michael J. B. Messemmer, a Tammany insider and chief coroner for the city; and Louis de Plasse, a physician and Belgian noble. Their other partners, if I have identified them correctly, were Charles Villa, a French transplant associated with the newspaper *États Unis* and with the city's French-speaking elites; "Professor" Adolph Corbett, a concert hall proprietor seemingly in search of respectability; and Charles F. Nirdlinger, aspiring playwright and author. The diverse identities of this Mott-ley crew indicate the connections and networks that defined the masculine social world of New York's medical elite, as well as the francophone émigré community's role in trying to bring Pasteur's rabies vaccination techniques to the United States. Leading physicians rubbed shoulders with city officials, newsmen, talent from the world of arts, letters, and theater, and the men behind the scenes of rough-edged

entertainment venues, in an urban setting that readily permitted male sociability to break the boundaries of Victorian gentility and refinement.⁸

The newly founded institute promised “gratuitous care and treatment by the Pasteur system of inoculation” and “the study and scientific examination of the causes, development and improved means of treating hydrophobia.”⁹ As a first step toward this objective, the API immediately announced plans to have a physician visit Paris and learn Pasteur’s methods, and Alexander B. Mott highlighted the API’s intent to operate as a purely philanthropic enterprise, dependent on donors. In addition to learning the proper techniques, he observed that “suitable buildings must be procured, animals inoculated and a series of experiments made to satisfy the operator and those interested in the institution. For all this it requires money, and that can only be raised slowly and through the well known liberality of the public.”¹⁰ Pasteur initially rebuffed the elder Mott’s request to send someone to study in his laboratory with the dismissal, “You go too fast.” Mott responded by emphasizing the API’s seriousness of purpose and the need for a Pasteur institute in the United States in order to avoid the delays and high travel costs for animal bite victims who required vaccination as soon as possible. Pasteur did not respond immediately, but by early spring 1886, as he started to pursue institutional expansion, including fund-raising for a permanent rabies vaccination facility in Paris as well as the establishment of similar operations elsewhere around the world, he began to welcome foreign visitors who wanted to adopt his methods. At the end of March he invited Alexander Mott to send “a young physician” to Paris, and Valentine Mott immediately set sail.¹¹

The younger Mott arrived in Paris on 6 April, headed straight for Pasteur’s laboratory, and quickly gained a strong sense of confidence about how to reproduce the French master’s techniques. Pasteur’s procedure relied on the changes in microbial virulence that he and his collaborators learned to produce under controlled laboratory conditions, and that were central to his earlier work on vaccines for chicken cholera and anthrax, as well as Robert Koch’s research on anthrax and other infectious diseases. The virulence of an infectious agent, as measured by the incubation period between exposure and onset of symptoms, shifts under a variety of conditions, such as passage from one species to another, serial passage among individuals of the same species, or as a result of laboratory manipulation. In the case of rabies, Pasteur and Émile Roux inoculated rabbits with the disease by applying material derived from a dead rabid dog’s spinal marrow directly onto the rabbits’ brains.

They found that the rabbits developed disease more readily than dogs, and that after forty to fifty passages through rabbits, the incubation period decreased from fifteen to seven days before stabilizing. This stable and highly virulent strain of rabies in rabbits could then be attenuated by excising the dead rabbits' spinal cords and drying strips of the cords under controlled conditions. Desiccated cords gradually declined in virulence, such that after fourteen days they became weak enough to use for commencing immunization. Through inoculation with a series of cord-based preparations in sequence from weak to strong virulence, Pasteur and Roux's method allowed patients to build immunity to rabies.¹²

In a letter to his father that was published in the *New York Herald*, Mott detailed his first day in the laboratory. He observed and carefully described the inoculation of cord-based solution into dozens of human patients, and he witnessed the preparation of spinal cord from a dead rabbit, the trephination and inoculation of a live rabbit with rabies virus, and the storage jars where dried cords were kept in sequence. One assumes Mott had read Pasteur's dramatic paper of 26 October 1885, which announced the first successful application of prophylactic rabies treatment in humans and outlined Pasteur's methods for producing attenuated rabies virus. After just a day in Paris, Mott already thought he thoroughly understood the necessary procedures. As he noted toward the end of his letter to his father, "I saw the method of keeping the virus in jars. At present Pasteur begins with virus fourteen days old and ends with virus five days old, the strength diminishing as it grows older. So much for the process. I feel confident that I could do the whole without any trouble, care and cleanliness being all that is needed, once knowing what is to be done." Although the API originally expected its emissary would require several months of study, Mott spent just a month overseas before boarding a ship with Pasteur's gift of a rabies-inoculated rabbit and heading home.¹³

The introduction of rabies vaccination to New York City did not proceed nearly as smoothly as Mott expected, however. Due to the limited range of available sources, some parts of the chronology are not entirely clear. But it appears that the American Pasteur Institute provided Pasteur treatment to just a dozen patients by the end of 1886, and although it may have survived on paper for another year, it probably took no new patients in 1887. The vagaries of transferring knowledge and laboratory practices conspired with the dynamics of expectation, disappointment, and media attention, and the expected philanthropic support never materialized.

Valentine Mott encountered more difficulty than he had originally antici-

pated in reproducing the Pasteur laboratory's methods. The textbook outline of Pasteur and Roux's procedure sounds simple enough, although one senses, as did observers in the late nineteenth century, the dangers of using live virus, especially from the increasingly fresh cords toward the end of the inoculation sequence. Real-world experience, however, proved another matter entirely for the American Pasteur Institute. Scholarship in science studies has long established the difficulty of transferring laboratory practices from one locale to another, the tacit forms of knowledge required to replicate experiments, and the sociological dimensions of deciding whether failure to reproduce results reflects faulty techniques or disproof of the original findings. Any university student who has ever taken a lab course also knows through direct experience the difficulty of reproducing even the simplest experiments and most established scientific results. In the case of Pasteur treatment, by the summer of 1886 a series of foreign visitors, including Mott, had studied preventive rabies treatment in Paris. Upon their respective departures, Pasteur provided each of them with "the raw material"—such as the culture medium of a rabies-inoculated rabbit that Mott received—with which to establish facilities for Pasteur treatment in their home countries.¹⁴ That training, however, did not guarantee the establishment of new institutions. For example, as Gerald L. Geison explained in his classic study, two of the early visitors, G. Amoroso from the medical faculty of the University of Naples and Anton von Frisch of the Vienna Polyclinic, became powerful critics of Pasteur because they were unable to reproduce the French scientist's findings, but Pasteur and his backers argued that Amoroso had misrepresented his qualifications, and that von Frisch had faulty laboratory technique. According to Geison, the determination in favor of Pasteur's original results over Amoroso's and von Frisch's failed confirmation depended less on decisive evidence and pure reason than on Pasteur's superior ability to mobilize support for his views, particularly within the nationalist environment of the French Académie de médecine.¹⁵

Meanwhile, in the United States, the Motts achieved decidedly mixed laboratory results. They expected a rapid start-up, and newspapers reported a lively scene of rabbits at various stages of inoculation in the Mott family home days after the younger Mott's ship arrived in New York.¹⁶ Valentine Mott also used the spurt of press attention surrounding his return to remind the public of the funds necessary to support New York's latest medical enterprise. The API, he stated, needed just \$5,000 to establish itself on a firm basis. "Here," he exhorted, "is an opportunity for some of our rich men. So far a few

medical men have defrayed all the expenses incurred, but that cannot go on forever. . . . Even rabbits cost money.”¹⁷ Less than a week later, the Motts announced their acquisition of space at Bellevue Medical College’s Carnegie Laboratory and their expectation of opening for patients in ten days.¹⁸

Shortly thereafter, however, delays and setbacks mounted. In early June, a boy from Cincinnati who had suffered a bite from a suspected rabid cat, as well as a Westchester County boy bitten by a possible mad dog, arrived in New York City with their parents in the hope of undergoing Pasteur treatment. Both children came from poor families and lacked the financial means to travel to Paris, but the Motts still had not managed to produce a regular enough sequence of desiccated spinal cords.¹⁹ Although Pasteur’s method seemed clear and simple in theory, neither of the Motts specialized in infectious diseases, and as surgeons of their respective generations, they likely possessed little experience with microbial laboratory techniques. Just days earlier, the *Medical Record* had commented skeptically about the API’s prospects and the need for “some authentic information . . . as to how well qualified the gentlemen composing this organization are to carry out their purpose.” The Motts, editor George F. Shrady implied, underestimated the challenge of their undertaking: “The [vaccination] technique, as is well known, is difficult, and involves a thorough knowledge of all Pasteur’s views and methods of work, as well as no inconsiderable amount of time.”²⁰

Good reasons existed for such doubts. By the mid-1880s, surgeons achieved a new level of stature in the social hierarchy of American hospitals through the adoption of antisepsis, but the ability to maintain sterile conditions hardly reflected the full range of techniques in the evolving bacteriological laboratory. Moreover, in clinical settings, the finer aspects of laboratory analysis and methods remained the province of pathologists, whose remove to cramped and poorly lit quarters in the far reaches of the hospital reflected the low status of laboratory analytics in institutionalized clinical practice, despite the centrality of pathological anatomy to medicine’s conceptual architecture. Meanwhile, although medical enthusiasm greeted the rise of germ theory in America, routinized application lagged behind. Bacteriological methods had only just begun their ascendancy in New York medical circles in 1885, when T. Mitchell Prudden started to teach medical bacteriology at the College of Physicians and Surgeons shortly after he himself took a monthlong course under Robert Koch in Berlin. Furthermore, ten years later, when the Department of Health’s bacteriologically experienced Research Laboratory decided to provide Pasteur treatment, laboratory personnel also encountered diffi-

culties in producing a fixed virus with a consistent incubation period, and after more than six months of effort, America's leading public health laboratory had not yet succeeded in immunizing test animals against rabies, much less humans. In the end, it took the Research Laboratory nearly two years to start vaccinating patients, a fact that testified to the difficulties of undertaking rabies vaccination even for skilled laboratory practitioners. Given these circumstances, it is difficult to imagine two American surgeons in the mid-1880s, no matter how capable in their own specialties, translating the principles of Pasteurian rabies vaccination into direct practice without difficulty. Ultimately neither the Cincinnati nor the Westchester County boy undertook treatment in New York, and their subsequent fate remains unknown.²¹

The Motts tried again a month later, but the American Pasteur Institute's first recorded attempt at treating a patient ended prematurely with the boy's inability to tolerate the injections. Seven-year-old Harold Newell of Jersey City was bitten by the family's pet dog on 24 June, and the dog's subsequent aggressiveness and sudden death two days later led the boy's father, a physician, to suspect rabies. William T. Newell then took his son to New York City in order to consult with Valentine Mott. Mott's postmortem analysis of the dog revealed material from a door mat in its stomach, a highly suggestive sign of rabies according to conventional diagnostics that cited mad dogs' tendency to ingest all manner of foreign substances. Mott still did not have the necessary sequence of rabbit cords, but he hoped to be ready within a few days. Finally, on 5 July, Mott administered the first of a planned series of fourteen injections. Expectations still ran high. As the *Herald* remarked, "One of the most memorable incidents of the celebration of Independence Day in New York was the first inoculation on Pasteur's method for hydrophobia ever performed in this continent."²² Harold developed episodes of weakness and nervousness following the inoculations, however, and after the fourth shot, Drs. Mott and Newell agreed to abandon the treatment. Newell attributed his son's adverse reactions to blood loss following a series of unfortunate accidents that had befallen him in addition to the dog bite—a head wound from a rock thrown by another boy, a fall and cut to the nose on the stairs to a train platform, a severe cut to the wrist from a broken pitcher—and he expressed his full confidence in the Pasteur method.²³ Nonetheless, the damage had been done as far as the American Pasteur Institute was concerned.

The Motts's enterprise attracted a relatively high level of public interest during the period from Valentine Mott's return from Paris to the saga of Harold Newell. Although not a lead story, New York newspapers generally

followed happenings at the American Pasteur Institute, and the *New York Herald*, which had taken charge of facilitating and spreading the story of the Newark boys, paid particularly close and regular attention to its efforts. When little Harold became a patient, papers from around the country, including nearby New Jersey, as well as Ohio, Michigan, Missouri, Georgia, Louisiana, and California, picked up the story about the first-ever application of the Pasteur treatment in America.²⁴ The newspapers did not report on whether young Harold survived his multiple ordeals. From late May until late July, however, the overall narrative arc of the New York effort to bring Pasteur treatment to the United States was one of promise, delay, and finally, failure.

Funding woes accompanied the API's unmet expectations during this critical period of public attention. A commentator at the *Weekly Detroit Free Press* suggested the lack of donors reflected an ebbing of interest following Pasteur's dramatic announcement the previous fall. The writer observed, "Popular interest here in Pasteur's discovery has diminished very much since the sensation caused by its first announcement. . . . The tremendous hub-bub made about those Newark children had its natural effect. After high excitement there came reaction and a sort of indifference."²⁵ Pasteur himself, however, certainly experienced no such difficulties following his initial triumph, and New York physicians also clamored for the establishment of a rabies vaccination facility in their own city. In France, a steady flow of patients quickly developed, and funds poured into Paris. According to the *Brooklyn Daily Eagle*, by early June 1886, Pasteur's laboratory had already examined some 1,100 patients and raised \$200,000. Around that time, when the *Tribune* reported on the Cincinnati and Westchester County boys whose parents hoped to have vaccinated in New York, the paper also noted that the cases elevated "public interest in the progress made by the founders of the American Pasteur Institute," and that the Motts wanted to raise \$50,000 to build a permanent facility, along with \$5,000 a year in operating costs. According to the *Boston Daily Advertiser*, however, as Harold Newell commenced treatment a month later, the Motts had received just "two \$10 subscriptions," and Alexander Mott warned that the American Pasteur Institute would have to close its doors by the end of August if higher levels of support did not appear.²⁶

The evidence is circumstantial, but the American Pasteur Institute's long-delayed opening and its failure to administer a full course of treatment to its very first patient likely doomed its prospects. The Motts's promises fell flat compared to the drama surrounding Pasteur's bold announcement of Octo-

ber 1885 and his subsequent record of regular success in immunizing patients. The API never recovered from the early blows to its reputation. In the middle of August, when the institute administered full courses of Pasteur treatment to two new patients, the papers paid little attention, and furthermore, a bitter Valentine Mott ducked the few reporters' inquiries that materialized. "I don't think the public have a right to know," he testily informed the *New York Tribune*. He complained, "The public have shown no disposition to subscribe to the support of our institution and I do not care for any further notoriety in connection with it."²⁷ Two weeks later, Mott presented a paper at the American Social Science Association's annual meeting in which he expounded on Pasteur's methods and treatment record at length. At the end of his presentation, he briefly recounted successful immunizations by his institute in three cases, two involving bites from dogs that "were undoubtedly mad," plus his own self-inoculation against rabies.²⁸ A couple of newspapers issued desultory reports of Mott's general comments about rabies and the treatment of dog bites, but stayed silent about the API's latest developments.²⁹ The Motts, it seems, had missed their window of opportunity, and they perhaps also lacked the entrepreneurial skills to keep that window open.

Continued problems with maintaining the required range of attenuated virus may have also impeded the Motts. By the end of 1886, the American Pasteur Institute had treated about a dozen people, including three Mississippi children who traveled with their parents to New York City in November.³⁰ The API's lack of sufficiently attenuated virus on hand to treat the children, who had to wait three days before commencing injections, underscores the importance of the animal-based order behind rabies vaccination. Apparently the institute still had not managed to routinize the preparation of rabbit cords, whether as a result of faulty technique or the burdens of sustaining a constant supply of live rabbits.³¹ Then in January 1887, when a New York society woman sought Pasteur treatment following a suspicious bite from a pet dog, Alexandre Liautard and Valentine Mott provided her with a letter of introduction to Pasteur, and she set sail for Paris rather than undergoing inoculation in New York City. This circumstance, combined with a lack of subsequent references to the Motts's outfit, suggests that the API had closed its doors, although possibly it limped along as an institutional entity on paper for another year.³² The experience continued to grate upon Valentine Mott. In November 1887, the *New York Herald* described Mott's sullen response to its query about the prospects of introducing Pasteur treatment in

New York's hospitals: "[He] refused in a tone of disgust last evening to express any views in regard to the hospitals being supplied with the means of applying the Pasteur method. He had done all that he could to induce its adoption, if only in an experimental way . . . and he had failed."³³ Thus ended the Motts's attempt to tie private philanthropy to public health, along with the first American effort at importing Pasteur's technique for preventive hydrophobia treatment.

Diversification and Institutional Ambition: The New York Pasteur Institute and Rabies Vaccination in New York City

For the next three years, Americans who wanted to undergo Pasteur treatment had no choice but to head for Europe. Then in February 1890, the New York Pasteur Institute pronounced itself open and ready to receive patients. Unlike the American Pasteur Institute, the new body soon built a firm place for itself in New York City's medical establishment, thanks to its technical mastery of Pasteur's regimen, as well as a range of funding mechanisms that encompassed private donations, patients' voluntary payments for vaccination, public funding from local and state governments for preventive hydrophobia treatment, the opening of a sanitarium for patients with a broad range of chronic ailments, and the commercial production and sale of biological agents for pharmaceutical purposes. This diverse set of financial arrangements pulled the NYPI toward multiple identities. Was the institute a philanthropic enterprise? A specialized hospital? A commercial venture? An arm of New York City's public health apparatus? To a great extent, it was all of these things. But most of all, the NYPI built its fortunes as a pharmaceutical supplier, one that competed alongside the H. K. Mulford Company, Parke Davis, Smith Kline, Squibb, Merck, and other corporate pioneers in the manufacture and mass distribution of "biologicals"—pharmaceutically useful agents derived from and cultivated in animals' bodies—during the 1880s and 1890s.³⁴

On 18 February 1890, the New York Pasteur Institute opened with a modest reception for twenty or so local French dignitaries, medical professionals, and journalists. Paul Gibier, the new institute's founder, briefly described Pasteur's vaccination procedure, promised treatment free of charge to those in need, provided a tour of the facility, and showed his visitors displays of the brain and spinal cord of a dissected rabbit and a live rabbit in the final stages of rabies.³⁵ The active launching of the NYPI also proceeded smoothly, and in contrast to the American Pasteur Institute, a steady stream of patients quickly developed. During one week alone in July 1890, Gibier's outfit admitted ten

new patients, for a total of twenty-five actively undergoing treatment, with 310 inoculations delivered in that seven-day period. By October, the New York Pasteur Institute had examined 610 worried animal bite victims and successfully administered Pasteur treatment to 130, a salutary outcome at a time when Pasteur institutes generally lost about 1 percent of patients vaccinated, usually as a result of delays in seeking treatment. Just under half of the vaccinated patients came from New York State, while the rest originated from an additional eighteen states plus one person from Ontario, Canada. In line with Gibier's stated commitment to philanthropy, 80 of the initial 130 recipients of preventive rabies vaccination enjoyed free treatment.³⁶

Bert Hansen has suggested that Gibier succeeded where the Motts failed thanks to good timing, because by 1890 "the notion of medical progress had become more widely grounded" in American culture.³⁷ That explanation probably mattered much less, however, than Gibier's combination of laboratory expertise and entrepreneurship. Gibier possessed extensive experience with infectious disease, a deft ability to mobilize Pasteur's reputation on his own behalf, and, as the NYPI evolved over time, an institutional model that relied on multiple sources of funding as well as diversification in its offerings. Indeed, within a few years, Gibier had the makings of an impressive biomedical empire.

Gibier's French medical background and laboratory training, which led to an early career occupied with infectious disease and its management within the evolving framework of the bacteriological revolution, was critical to his success in transferring Pasteurian rabies vaccination from Paris to New York City. Gibier was born in 1851, served in the military during the Franco-Prussian War of 1870–71, and at various points worked in a machine shop and as a railroad clerk before embarking on a medical career in Paris. He studied medicine at the University of Paris, worked as a resident in some of the major city hospitals in the early 1880s, and obtained a laboratory position at the Museum of Natural History (*Muséum d'histoire naturelle*), one of the leading institutions of nineteenth-century French science. There he worked as an assistant to Henri Bouley, the prominent French veterinary expert. Bouley's well-known lectures on hydrophobia were just one small part of his *résumé*. He also held the professorship in comparative pathology at the natural history museum, and he served as president of the French Academy of Sciences in 1884–85, a position that highlighted the importance of veterinary science and its agricultural applications to French national priorities. Under Bouley's guidance, Gibier pursued a variety of research projects, including a series of

experiments on rabies in animals that earned him a medical doctorate from the Faculty of Medicine at Paris in 1884.³⁸

Gibier's doctoral thesis provides considerable evidence of his immersion in the laboratory and familiarity with the methods of bacteriological research. His dissertation discussed experiments that he had conducted on a wide range of topics, including techniques for inoculating animals with rabies, the use of cold temperatures for attenuating rabies virus and other infectious agents, and some cases in which animals had possibly gained immunity from exposure to attenuated virus, although Gibier cautioned that he had not had time to confirm that result. He also reported some negative findings. All manner of histological methods proved inadequate to identify the source of rabies, although as a confirmed follower of germ theory, he remained certain that "the microbe of rabies exists." Gibier also used rats to test therapeutic agents ranging from garlic to chemicals such as strychnine, as well as different mixtures of oxygen and air at various pressures, and confirmed that none showed any preventive or curative effects.³⁹ One readily senses a lack of patient, methodical experimental design in Gibier's thesis—the "hunt-and-try" approach of puttering about and hastily examining the effects of multiple reagents and varied laboratory conditions defined Gibier's work, as it did so much of late nineteenth-century invention, laboratory science, and early social scientific inquiry.⁴⁰ His failure to follow up on whether he had actually succeeded in immunizing animals against rabies seems particularly indicative of a certain haphazardness in his approach to research.

The question of Gibier's ability to conceptualize experiments, however, matters less here than what his thesis reveals about the broad array of skills he possessed, such as ease with the handling and manipulation of microbial cultures and laboratory animals, an ability to maintain constant temperature through the use of a specialized apparatus as well as uniform laboratory conditions in other respects, and familiarity with a broad array of histological techniques for examining animal cells and tissues. By contrast, no evidence suggests a similar level of laboratory expertise on the Motts's part. To the extent that successful transfer of Pasteurian rabies vaccination rested upon requisite techniques, Gibier possessed the laboratory knowledge and experience necessary to introduce the new procedures to the United States.⁴¹

Gibier's subsequent ventures in public health further enhanced his potential to transplant Pasteur treatment from Paris to New York City. After completing his doctoral thesis, Gibier moved beyond the laboratory to problems of infectious disease in the field, and starting in the mid-1880s, he held

several important official appointments in the French scientific and public health establishment. In 1884, he took part in an official medical mission, sponsored by the Ministry of the Interior, to organize medical aid in the department of Midi during that year's cholera epidemic. The following year, Gibier served on the Ministry of Public Instruction's scientific mission to Germany to study the organization of medical laboratories, and he also traveled under official auspices to Spain to study Spanish physician Jaime Ferrán's cholera vaccination methods. For his work on cholera, Gibier was awarded the title of Chevalier in the French Legion of Honor in 1886. In its dossier on Gibier, the *Légion d'Honneur* noted his scientific discoveries and written work in the field of medicine, especially infectious diseases that included anthrax, typhoid, rabies, and cholera. The French government subsequently dispatched Gibier to Havana in 1887 to investigate the microbial source of yellow fever. There he joined the legion of researchers who claimed, incorrectly, to have isolated the microbial source of the disease. A year later, Gibier headed from Cuba to Florida to continue his yellow fever research.⁴² Thus in contrast to the Motts's limited experience, during the 1880s, Gibier built an extensive record of engagement with problems of infectious disease, full familiarity with bacteriological techniques, and ties to the powerful French institutional apparatus of laboratory-based medicine and public health prior to his introduction (or reintroduction) of Pasteurian rabies vaccination to the United States. Gibier's full-fledged immersion within the worlds of French laboratory medicine and public health, as opposed to the American surgical background of the Motts, made him a far more likely conduit for the successful transplantation of rabies vaccination to the United States.

Gibier also created a public impression of close personal ties to Pasteur, as compared to the scant few weeks Valentine Mott spent in Paris in order to establish a Pasteurian reputation. In the late nineteenth century and early decades of the twentieth century, the ability to claim direct and intimate association with Pasteur constituted a significant resource that providers of rabies vaccination and other laboratory-based services for combatting infectious diseases used to establish their authority. As John Strachan has observed in his historical work on the Pasteur Institute of Algeria, "The Pastorian mystique had the potential to confer considerable status on doctors and scientists who could trace themselves back to Pasteur or to one of his close associates. . . . Lineage became the hallmark of professionalism and the criteria [*sic*] by which the authenticity of would-be Pastorians could be judged."⁴³ This logic held not just for Pasteur Institutes at far reaches within the French

Empire, but also elsewhere around the world, including the United States. Hence reports during Gibier's lifetime suggested that he came up with the idea of opening a Pasteur Institute while visiting New York City after his sojourns in Cuba and Florida, and that the city's medical community immediately welcomed the prospect. Gibier then returned to Paris, discussed the possibility with Pasteur and earned his support during the winter of 1889–90, and subsequently launched the New York Pasteur Institute with the great French savant's blessing.⁴⁴

A far more complex historical reality lay behind Gibier's Pasteurian linkages and his move to New York, however, especially with respect to the actual extent of Pasteur's support. Gibier first began to attract notice in New York City in 1888, when the news media relayed word of his yellow fever research in Cuba and Florida. Early coverage warmly greeted "the young physician," and when Gibier traveled to New York in 1889 to discuss his yellow fever work and to take up a position at the city's French Hospital, the *Herald* extolled him as "a disciple of Pasteur and of Koch" who "is considered one of the most progressive and studious physicians in France."⁴⁵ When Gibier launched the New York Pasteur Institute, he touted his own Pasteurian credentials, and newspapers readily absorbed his self-fashioning. Upon the opening of the NYPI, for example, news stories variously described him as "repeatedly engaged in work with Pasteur and other eminent scientists," a past "assistant to Pasteur and Paul Bert," "formerly Pasteur's co-laborer," "a pupil of Pasteur," and "a long time pupil and associate of M. Pasteur."⁴⁶ Reports in later years continued to describe him in similar terms: for example, as "one of the first physicians who became pupils of Pasteur" or "physician-pupil in the Pasteur laboratory."⁴⁷ Newspapers presumably gained these impressions from Gibier himself, and they occasionally provided direct quotations. In a February 1890 interview with a reporter from the *Knoxville Journal*, for example, Gibier emphasized that the virus he used for vaccinations was "identical" to Pasteur's, and he stated confidently, "I was with [Pasteur] for several years and am familiar with all his methods and especially with the preparation and application of the virus."⁴⁸ Upon Gibier's death, a memorial essay by his nephew, George Gibier Rambaud, placed him in Pasteur's laboratory for several months in 1886, approximately the same time period when Pasteur began to train foreign visitors in preventive hydrophobia treatment.⁴⁹

Independent confirmation of such claims remains elusive, but Gibier probably was not as close to Pasteur as most of these sources implied. His Legion of Honor file, which covers the period up to March 1886, contains no men-

tion of work with Pasteur in Gibier's list of achievements. His own 1896 memorial essay to Pasteur, published in the NYPI's in-house journal, suggested no more than a modest connection. There Gibier cited his "good fortune to study under the direction of the illustrious and regretted creator of bacteriology" and "at a certain moment to assist him in his experiments" related to anthrax, but he did not identify himself as a full-blown student or assistant.⁵⁰ One could easily imagine that Bouley, Gibier's mentor, facilitated this more limited opportunity for Gibier to work under Pasteur. Bouley and Pasteur shared a warm relationship, and Pasteur relied on Bouley as a powerful ally who helped to shepherd his discoveries through the rocky internal political terrain of the French medico-scientific establishment.⁵¹ Gibier also clearly did not belong to the elite pantheon of close senior collaborators such as Émile Roux and Elie Metchnikoff or the "great Pasteurians" among Pasteur's students, in particular, Albert Calmette, Alexandre Yersin, Charles Nicolle, and Jules Bordet. Nor did the New York Pasteur Institute ever establish a direct institutional linkage to Paris.⁵² Gibier did, however, have a keen interest in the kinds of practical scientific problems that motivated Pasteur's followers, as evidenced by his publications on microbiology and its agricultural applications, and on the etiology, symptoms, treatment, and prevention of infectious diseases, including cholera, rabies, and yellow fever. He also may well have learned how to attenuate rabies virus and vaccinate patients along with the coterie of French physicians who picked up the technique at Pasteur's laboratory in the 1880s.⁵³ Whatever the specifics of Gibier's relationship to Pasteur, by the late 1880s, Gibier probably understood that he would not reach the highest echelons of French academic achievement, but that he could establish himself as a prominent representative of French medical science by moving to the United States.

His relative marginality within the institutional networks of the overseas Pasteur institutes should not exclude Gibier from a share of the Pasteurian legacy, however. Even the officially recognized branches, mainly in French colonial outposts, had to establish their reputations on their own before gaining formal status from Paris.⁵⁴ Elsewhere, as Jean-Pierre Dedet has noted, "several institutes created unilaterally in various countries around the world . . . took the name of Pasteur without authorization from the mother institution," and the energetic and effective activities of self-declared Pasteurians with weaker ties to central authority contributed to the dissemination of Pasteur's image, ideas, and practices worldwide.⁵⁵ Gibier invoked Pasteur in order to promote his own prospects in the United States, but through his

success, he also extended the reach of Pasteurian science by facilitating the movement of rabies vaccination, as well as diphtheria antitoxin and other laboratory products and practices, to the United States.

In addition to Gibier's ability to tout connections with Paris, diversification in patronage and products contributed strongly to the New York Pasteur Institute's institutional ascendance in the 1890s. Gibier embarked on his rabies vaccination enterprise with his own funds, but he quickly developed other sources of support. The New York Pasteur Institute promised free treatment to anyone in need who could not afford to undergo vaccination, but it also emphasized that those with the means ought to pay. For a full course of Pasteur treatment, Gibier generally charged about \$100, not including room and board.⁵⁶ On top of that, donations provided a key resource for maintenance and expansion. Just months after the institute opened, a donor in the form of an unnamed "wealthy Wall Street man" promised funds for a new building near Central Park, and in June 1893, the NYPI moved to a stately five-story building of brick and stone at Central Park West and 97th Street that boasted both generous laboratory facilities and comfortable accommodations for patients.⁵⁷ In other cases, donations offered a private source of public health provision. For example, the nearly \$800 left over from the public subscription for the Newark children was handed over to the NYPI in March 1891, in exchange for free treatment of patients from New Jersey for the next five years.⁵⁸ Direct state funding played a similar role. In late May 1895, the New York State Legislature passed "an Act to provide for a permanent establishment for the cure and prevention of hydrophobia." The new law appropriated \$6,000 annually to the New York Pasteur Institute in order to fund rabies vaccination for indigents who were state residents, and it imposed state oversight in the form of inspection and annual reporting requirements.⁵⁹ Elsewhere, other local and state governments also raised or appropriated funds to have their residents vaccinated.⁶⁰

Critics sometimes contested the use of government funding to support private institutions. The *New York Herald*, for example, opposed the original bill to appropriate funds for free vaccination by the NYPI on the grounds that the proposal was "hasty, ill considered and extravagant." The *Herald* explained, "Dr. Gibier's establishment is, and always has been, a private institution, and there is no plausible reason why it, rather than hundreds of other praiseworthy institutions for the possible saving of life, should receive the great advantage of a State endowment."⁶¹ Such critiques remained relatively

unusual, however, in an era of blurred boundaries between public and private in nineteenth-century governance. Chapter 6 details the extent to which a blended public-private relationship was, and continues to be, completely characteristic of American political institutions and the execution of public policy in the United States. For now, it is enough to acknowledge how creative forms of public financing provided the NYPI with material support and reflected its public stature.

Rabies vaccination provided the launching point for farther-reaching clinical aspirations, and Gibier's expanded horizons became apparent within his institute's first year of operation. In December 1890, when the NYPI organized formally as the New York Bacteriological Institute, its certificate of incorporation announced general purposes beyond rabies vaccination, as an establishment "for the study and gratuitous treatment of contagious diseases, comprising a 'Koch' and a 'Pasteur' department for the treatment of tuberculosis and hydrophobia."⁶² In 1893, with the new facility at Central Park West, Gibier moved well beyond rabies vaccination by opening a sanitarium for paying patients that provided treatment for a broad range of ills, including "nervous affections, alcoholism, drug habits, diabetes, kidney and pulmonary diseases, rheumatism," and other noncontagious conditions. NYPI advertisements also highlighted the availability of Charles-Édouard Brown-Séquard's method of hormonal rejuvenation therapy, a regimen then in vogue that employed testicular extracts from animals to treat "Locomotor Ataxia and nervous exhaustion."⁶³

Other endeavors, such as the series of weekly lecture-demonstrations that Gibier offered in 1895 to introduce medical practitioners to the latest advances of the bacteriological laboratory, explored additional sources of institutional possibility and revenue, although the NYPI never developed full-blown plans to become a major teaching facility.⁶⁴ Instead, on top of its clinical expansion, the New York Pasteur Institute also took its lead from the rapidly evolving American pharmaceutical industry. Like most of the Pasteur institutes around the world, both those formally affiliated with Paris and those established independently, the NYPI used rabies vaccination as a starting point, but aspired toward providing the full spectrum of therapeutics and prophylactics that represented the riches and possibilities of the modern bacteriological laboratory.⁶⁵ Gibier conducted some original investigations as well, but research was not his forte, and unlike the more prominent overseas Pasteur institutes with formal ties to Paris, the NYPI never developed a dis-

tinguished research record. Instead, Gibier's talents lay with organization and entrepreneurship, and the NYPI, with its rapid proliferation of products and services, entered full force into the growing market for biologicals.⁶⁶

Gibier was not alone in following this varied path of multiple revenue-generating enterprises. For example, William A. Hammond, who, like Gibier, always looked ahead to new opportunities, opened a sanitarium after he moved to Washington, DC, in 1888. Hammond subsequently went into the business of manufacturing animal extracts, first through the Columbia Chemical Company, and then through a competing venture, the Hammond Animal Extract Company. These enterprises did not fare well. His medical reputation suffered as fellow physicians skeptical of rejuvenation theory attacked Brown-Séquard as "in his dotage" and Hammond as "a fraud." Furthermore, Hammond lost a lawsuit for producing animal extracts under his own name after he had earlier signed his rights over to the Columbia Chemical Company, while the sanitarium became embroiled in financial disputes between Hammond and his business partner.⁶⁷

As Hammond's iffy experiences indicated, scaling up from an individual medical practice to more ambitious and highly complex business dealings required diverse managerial abilities as well as legal and financial savvy. During the last third of the nineteenth century, successful pharmaceutical companies in the United States pursued growth through an aggressive combination of corporate strategy, standardized production, and laboratory science. For Squibb, Merck, Smith Kline, Parke Davis, and other industry leaders, the establishment of analytical laboratories, company journals, corporate-sponsored pharmacological expeditions, global supply chains, and national and global markets together signaled a new era of scientifically based, industrially made pharmaceuticals that symbolized the promise of the laboratory in an age of capitalism.⁶⁸ In the 1890s, this corporate landscape expanded further to include the production of a growing array of vaccines and other biologically based laboratory products that relied on the generative capacities of living animals' bodies. As Michael Willrich has observed, the late nineteenth-century vaccine industry was "part animal husbandry, part laboratory science," and the major pharmaceutical enterprises enhanced their reputations "by harvesting pus from the undersides of barnyard animals" within this nexus of stable and bacteriological laboratory. So-called vaccine farms originated in the 1870s as small outfits in which adept medical practitioners capable of handling themselves in agricultural settings could go into business for themselves. The corporatization of biologicals came two decades later.⁶⁹

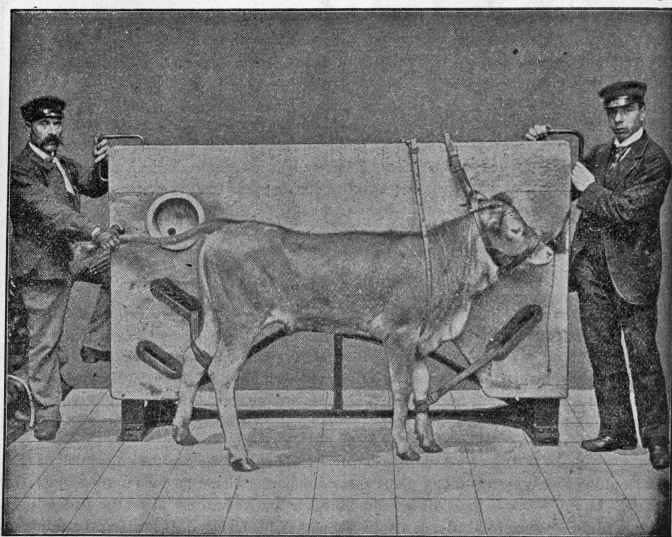
Biologicals shifted corporate bases from urban to rural facilities, and their nonproprietary character required companies to emphasize purity and sanitary standards as a means of differentiating their products. Philadelphia's H. K. Mulford Company, for example, used the production of diphtheria antitoxin in the mid-1890s as a springboard for diversifying to some eleven different biologicals by 1898. Cramped, dirty, and expensive city stables soon became inadequate for maintaining the herds of horses and cattle necessary for making different antitoxins and vaccines, and in 1896, Mulford opened a new facility on 160 acres of farmland located eight miles from the city center. The move from urban to rural helped the company project an image of pure, high-quality goods produced in a salubrious rural environment, and sanitary inspections by the Pennsylvania State Board of Health and the US Hygienic Laboratory sealed Mulford's reputation for sanitary and scientific production. Other large companies followed similar paths as they entered into the biologicals market.⁷⁰

The NYPI's efforts typified this industrial, corporate context of late nineteenth-century pharmaceutical endeavor. Within just a few years of its founding, the institute began to offer a variety of biological agents for physicians to purchase and use. As of January 1893, the New York Biological and Vaccinal Institute, created as a division of the NYPI, sold smallpox vaccine as well as glandular extracts prepared according to the Brown-Séguard method.⁷¹ Additional goods followed, with an array of thirteen products—vaccines, serums, animal extracts, and other biological preparations—for sale by 1897. As the NYPI began to market biologicals, Gibier also started an in-house journal. Like other company journals, the *New York Therapeutic Review* (renamed the *Bulletin of the Pasteur Institute* in 1897) highlighted the work of its sponsor and the clinical efficacy of its products, and it also carried advertisements for the NYPI's offerings. In addition, the NYPI's Biological and Vaccinal Institute added analytic laboratory services in 1896, a somewhat unusual move when pharmaceutical companies founded analytical laboratories mainly to carry out internal quality control, but one that still reflected the key institutional features of the pharmaceutical industry.⁷²

The NYPI's quick expansion from rabies vaccination to general-purpose therapeutic facility and biologicals producer also prompted an ambitious move from the city to the countryside that paralleled simultaneous developments among pharmaceutical companies. At the end of 1895, Gibier purchased two hundred acres in Suffern, New York, a rural town just twenty-five miles from New York City, where he planned a massive operation. Gibier immediately

New York Biological and Vaccinal Institute

VACCINAL DEPARTMENT.



Preparation of the Heifer for the Inoculation of Cow-Pox.

It may be of interest to our readers to learn that we have published some very important papers during the past year, 1895, the titles of which are as follows:

Reports of Physicians who have used the Diphtheria Antitoxin Prepared at the New York Pasteur Institute.

Antitoxic Serums, by E. Roux, M. D.

Biological Investigation of the Toxic Effects of Infinitesimal Quantities of Metallic Salts.—Editorial.

The Physician and the Social Question, by Paul Gibier, M. D.

Toxin and Antitoxin of Tetanus, by Paul Gibier, M. D.

The Treatment of Diabetes by Alternation Medication, by Dr. Albert Robin.

Serotherapy in Cancer, by Paul Gibier, M. D.

Streptococcus Infections and their Treatment by Anti-Streptococcus Serum, by Geo. G. Van Schaick, M. D.

Further Studies concerning the Effects of Snake Venom, according to Dr. A. Calmette.

The Treatment of Lumbago, by Prof. A. Robin.

A Novel Treatment of Metrorrhagia and Other Hemorrhages.—Editorial.

Serotherapy in Scarlatina by means of Marmorek's Anti-Streptococcus Serum, according to A. Josias, M. D.

Two More Cases of Tetanus, Treated by Gibier's Tetanus Antitoxin.—Editorial.

A Resume of Twenty-five cases of Diphtheria Treated by Diphtheria Antitoxin.—Ed.

Biology—The Means of Defense which the Inferior Vertebrates offer against Microbic Invasion, according to Messrs. Sabrazes & Colombot.

The treatment of Inoperable Malignant Tumors with the Toxins of Erysipelas and of Bacillus of Prodigiosus.—Coley.

A Treatment of Whooping Cough.—Joire.

Animal order and biologicals production at the New York Pasteur Institute:
 "Preparation of the Heifer for the Inoculation of Cow-Pox." *New York
 Therapeutic Review*, March 1896.

built two barns in order to replace the more haphazard urban options for stabling the large animals—particularly horses and cows—whose bodies provided the living factories that manufactured diphtheria antitoxin, smallpox vaccine, and other pharmaceutical agents. In addition to this expanded capacity for biologicals production, Gibier also planned a vastly enlarged sanitarium with three buildings to serve patients in the serene countryside, as a therapeutic alternative to the nerve-jangling environment of the city. Construction of the new patient facilities, estimated to cost from \$18,000 to \$20,000, commenced in February 1898 and finished four months later. The Central Park location closed, but the NYPI maintained an urban office on West 23rd Street to receive and evaluate animal bite victims.⁷³

Hence Gibier's empire evolved as a heavily commercial enterprise that treated the chronic conditions of paying patients and manufactured biologicals for a national market. How well it measured up to corporate competitors in the latter area remains unclear, but diphtheria antitoxin offers some insights into the uneasy tension between impatient entrepreneurial ambition and a laboratory ethic of careful, methodical work that marked Gibier's career. Gibier took particular satisfaction in diphtheria antitoxin, first developed by Émile Roux at the Pasteur Institute in Paris and introduced to the United States by the New York Pasteur Institute in 1894. As Bert Hansen has pointed out, most historical accounts have erroneously credited the New York City Department of Health with the introduction of diphtheria antitoxin and failed to recognize the NYPI's pioneering role as the sole provider of antitoxin in the United States and Canada from the fall of 1894 until early 1895. Gibier himself noted that between September 1894 and November 1895, the NYPI provided more than 11,500 doses of diphtheria antitoxin, with another 3,500 by February 1896. In Sheboygan, Wisconsin, the city health office monitored the results of NYPI-made diphtheria antitoxin used by private physicians and found a 50 percent drop in mortality rates, a highly gratifying finding for the NYPI, which it highlighted in its advertisements.⁷⁴ Subsequent laboratory analyses, however, suggested that the quality of Gibier's antitoxin did not match the hype surrounding it. In the spring of 1896, the State Board of Health of Massachusetts found that while Gibier's diphtheria antitoxin ranked third in sales, behind the NYCDH's and Behring's antitoxin, it "was found far below the standard as labeled upon the bottle; thus, a package marked to contain 2,500 units, by test was found to contain less than 700." Serum from some half dozen competitors, by contrast, was "essentially up to the standard."⁷⁵

Whether the NYPI's other biologicals suffered from similar lack of quality is unknown, and the institute's overall record presumably lies somewhere between its strong reputation in rabies vaccination and the Massachusetts finding on its diphtheria antitoxin. Gibier was certainly not alone in selling a subpar product in a largely unregulated industry that relied on self-imposed oversight and market forces to produce quality pharmaceuticals. John F. Anderson of the US Hygienic Laboratory observed in 1905 that before the advent of federal regulation, "any one could make a product, label it vaccine virus [i.e., smallpox vaccine] and place it on the market regardless of the impurities contained therein or its lack of potency, being governed in this respect only as it affected the business of the firm making it."⁷⁶ As Michael Willrich has written, investigations by state governments revealed desultory conditions in the industry, and in an era of limited state-level regulation and no federal regulation whatsoever of biologically active vaccines and therapeutics, poor quality and contamination posed significant risks. In 1896, for example, the Pennsylvania State Board of Health investigated fourteen vaccine farms around the country and found ten wanting in terms of sanitation and quality control, including that of the New York City Department of Health. The October 1901 tetanus outbreak in Camden, New Jersey, dramatically illustrated the all-too-real danger of such conditions, when tainted smallpox vaccine, most likely produced by the H. K. Mulford Company, killed nine children. Simultaneous reports from St. Louis of additional deaths from contaminated diphtheria antitoxin produced by that city's health department added to the clamor for greater public oversight. As physicians and public health officials debated the source of the tainted vaccine in the Camden cases and the general problem of vaccine purity, pressure mounted for regulatory reform. In response, the Biologics Control Act of 1902, signed into law by President Roosevelt on 1 July, instituted strict inspection, licensing, and testing protocols for purveyors of biologics traded across state lines.⁷⁷

The new regulatory regime, combined with random and unforeseeable contingencies, drastically shifted the NYPI's prospects. The beginning of the end came in June 1900, with Gibier's sudden death in a carriage accident. George Gibier Rambaud, Gibier's nephew and the superintendent of the NYPI's Biological and Vaccinal Institute, succeeded his uncle, but under vastly reduced circumstances. Gibier, it turned out, had a son in Paris who inherited most of his father's estate, including the Suffern facility.⁷⁸ Louis Gibier apparently sold off the land and buildings in Suffern, which left the

NYPI with its West 23rd Street office and rabies vaccination as the institute's mainstay. Rambaud failed to manifest Gibier's combination of ability, motivation, and means, and the NYPI never again attempted the enterprising diversification that had sustained its rapid growth in the 1890s. The Biologics Control Act, which raised a high bar for entry into the biologics trade, likely also accounted for the NYPI's foreshortened prospects after Gibier's death. The major pharmaceutical firms generally backed the new regulations, even if inspections sometimes resulted in short-term suspensions at the likes of Mulford, H. M. Alexander, and Parke Davis, because only the largest, most established, and best-heeled corporate manufacturers could afford to meet the strict licensing requirements, while smaller companies simply went out of business.⁷⁹ Faced with the prohibitively high costs of regulatory compliance, the post-Gibier NYPI could not easily reenter the biologics trade. In addition, the NYPI lost its local monopoly over rabies vaccination when the New York City Department of Health decided to enter the field and initiated yet another major institutional reconfiguration of rabies vaccination in New York City.

Competition: The New York City Department of Health and Rabies Vaccination

Throughout the 1890s, as Gibier pursued his grand institutional ambitions, urban public health also entered its so-called golden age, when laboratory science joined forces with turn-of-the-century progressive politics. Decades of effort on the part of the sanitarians came to fruition in the new era of the microbe, which replaced the generalized threat of filth and miasmas with specific targets, identifiable through bacteriological techniques, that reformers and public health advocates used to generate support for expert-defined systems of surveillance and disease control. Consequently, newly founded laboratories at municipal and state departments of health throughout the United States aggressively launched campaigns to prevent and control infectious disease through vaccination, sanitary inspection, and other vigorous public health measures. In New York City, the Department of Health's Research Laboratory rapidly developed into a powerful symbol of science and progressive reform, one that attracted eminent visitors from European laboratories and contributed to American public health's increasingly prominent international reputation in the 1890s and 1900s.⁸⁰ Amid the Department of Health's manifold activities, rabies vaccination offered yet another mission-

building opportunity, one that showcased the new stature of the bacteriological laboratory in American public health, and that brought the Research Laboratory in direct competition with the NYPI.

Hermann M. Biggs, the driving force behind New York's ambitious and expansive public health efforts in the 1890s and 1900s, led the health department's entry into the provision of Pasteur treatment. Biggs earned his medical degree from Bellevue Medical College in 1883, interned at Bellevue, and then embarked upon several months of study in Germany, first at Emil DuBois-Reymond's Physiological Institute in Berlin, and then at Greifswald. He apparently picked up some bacteriological experience during his German sojourn, and when he returned to New York in March 1885, he joined Bellevue's Carnegie Bacteriological Laboratory, which dispatched him to Paris the following December to investigate Pasteur's rabies inoculation methods. Biggs's European travels typified the kinds of laboratory tours that allowed aspiring American physicians and researchers to learn novel techniques, and thereby transfer new medical knowledge and practices from Europe to the United States. Biggs soon took over operations at the Carnegie Laboratory, until he joined the New York City Department of Health in 1892 as chief inspector of the newly created Division of Pathology, Bacteriology and Disinfection. There Biggs immediately established the health department's Research Laboratory, and he became the department's general medical officer.⁸¹

The new laboratory quickly attained a superior reputation for its integration of bacteriological endeavor into public health work, especially after it began to produce and distribute diphtheria antitoxin in 1895. In 1896, Biggs developed designs on rabies vaccination, and he dispatched Anna Wessels Williams to the Pasteur Institute in Paris, mainly to study techniques for producing streptococcus antitoxin, but also to learn methods for rabies vaccine production and diagnosis. Williams, a prominent and versatile bacteriologist and one of the foremost women in American science, started out in 1887 as one of Mary Putnam Jacobi's medical students at the New York Infirmary's Woman's Medical College. After earning her degree in 1891, she taught pathology and hygiene at her medical alma mater before turning to a laboratory career in 1894, when Mary Putnam Jacobi and Abraham Jacobi helped her land a position, initially as an unpaid volunteer, at the Department of Health's Research Laboratory. She worked with William H. Park to isolate a strain of diphtheria that led to the development of the health department's diphtheria antitoxin, and she began to look into rabies in 1895. Williams readily took up Biggs's assignment in Paris. Her studies paved the way for the Department of



Anna Wessels Williams, n.d. Anna Wessels Williams papers, Arthur and Elizabeth Schlesinger Library, Radcliffe Institute for Advanced Study, Harvard University.

Health to start offering preventive hydrophobia treatment in 1898, and, as discussed in the previous chapter, in 1904, Williams developed techniques for the rapid diagnosis of rabies through pathological examination of Negri bodies in brain tissue.⁸² In its annual reports for 1905 and 1906, the Board of Health eagerly touted the accomplishments of Williams and other bacteriologists at the Research Laboratory in rabies diagnosis and treatment. The laboratory's new, six-floor, state-of-the-art facility, which opened in August 1905, also suggested the new stature of bacteriology and its centrality to public health.⁸³

A vastly increased patient load accompanied this expansion of the health department's laboratory research and advances in diagnosis. By sending Williams to Paris, Biggs intended to take a first step toward challenging the New

York Pasteur Institute's monopoly over rabies vaccination. As he wrote to Park in July 1896, "I told Dr. Williams to go over the rabies work very carefully and take home some virus. I think we must take this up quietly and when everything is prepared to administer treatment, advise the Health Board. It will then be done. Say nothing now."⁸⁴ Around this time period, the Department of Health had already begun to encounter pressure from pharmaceutical companies that objected to the production of diphtheria antitoxin by a government agency, and the situation likely spurred Biggs's caution about moving into rabies vaccination.⁸⁵ In essence, he hoped to launch an institutional coup and offer Pasteur treatment as a *fait accompli*, which the board would have to support before any complaints could arise from Gibier's outfit.

Two years later, in the fall of 1898, the Board of Health authorized the Division of Bacteriology to provide rabies treatment, but the pace of work grew slowly. In 1900, the health department vaccinated or distributed vaccine to just twenty-eight dog bite victims. Five years later, however, that figure surpassed one hundred, and by 1907, it reached six hundred. On average, between 1908 and 1913, the department delivered vaccine to more than nine hundred patients a year. City residents received free treatment, while animal bite victims from upstate New York or other parts of the country were usually charged about \$25–50, depending on their ability to pay. Even the higher \$50 fee fell well below the NYPI's bill for paying patients, which was set in 1899 at \$200, including room and board.⁸⁶

Meanwhile, the Board of Health also asserted greater authority over rabies through the broader expansion of its animal inspection work, in which domestic animals' presence, economic significance, and centrality as part of the local food supply and transportation infrastructure provided an important site for the extension of the state's power over public health. The health department's capacity to handle and deal with animals increased by several orders of magnitude with the deployment of veterinarians to inspect cows and milk production, and to check horses for glanders, a deadly equine respiratory disease that could also infect humans. Given the essential nature of cows and horses as sources of nutrition and transportation, public health officials in New York paid close attention to dairy and stable inspection. By 1907, animal work had increased to the point that "animal inspection" now constituted a distinct category of the Sanitary Bureau's functions. Although dairies and stables remained its primary focus, the health department's corps of veterinarians also checked dogs involved in dog bite complaints and other dogs suspected of having rabies.⁸⁷ Canine examinations soon jumped dramat-



The work of the Research Laboratory on display, “Jubilee Exhibit,” 1923. In 1913, the newly designated “Bureau of Laboratories” encompassed the Department of Health’s Research Laboratory and its Diagnostic Laboratory. Anna Wessels Williams papers, Arthur and Elizabeth Schlesinger Library, Radcliffe Institute for Advanced Study, Harvard University.

ically. In 1907, the department’s veterinarians evaluated some 1,100 dogs; that number leaped to more than 4,600 in the following year, and the veterinary corps continued to examine thousands of dogs annually in the period leading up to World War I.⁸⁸

During the 1900s, the New York Department of Health used its newly assertive mechanisms for rabies prevention and vaccination to build its prestige in the field and to make significant inroads into the Pasteur Institute’s previously exclusive territory. Although the NYPI continued for some time to maintain its lead in numbers of patients treated, in 1906, the health department could compare favorably its 340 patients vaccinated to some 450 or so at the NYPI, and it also boasted similar success rates.⁸⁹ An early signal of the NYPI’s decline in status appeared in the spring of 1901, when the state assembly passed a bill “making it permissive instead of mandatory for Over-

seers of the Poor in the various counties to send hydrophobia patients to the Pasteur Institute in New York City.” Although the proposal did not specifically name the Department of Health as an alternative source of treatment, the new wording suggested official recognition of the possibility. The final version of the bill became law in July.⁹⁰ Other developments testified as well to growing competition between the health department and the NYPI. In addition to vying for patients, for example, both institutions also examined animal brain tissue in order to diagnose rabies, and access to animal bodies and body parts sometimes became a point of contention.⁹¹ On other occasions, an informal division of labor ensued, in which, say, the Pasteur Institute took the patient while the health department ended up with a canine corpse for analysis.⁹²

Competition for live patients rarely erupted in the open, but one such case made headlines. In May 1907, William Cooper Procter, president of the Procter and Gamble Soap Company, suffered a bite while trying to separate two of his setters, and he subsequently discovered that rabies had infected nearly every dog in his kennel. Newspapers across the country reported the soap magnate’s dire plight (“Millionaire in Race against Hydrophobia”! “Millionaire in Death Race”! “Mad Dog Bites Millionaire”!) and his rushed departure for the New York Pasteur Institute.⁹³ When Procter instead took treatment from Daniel W. Poor and William H. Park at the Department of Health, the NYPI cried foul and accused the health department of poaching its patient. “All arrangements had been made” to treat Procter, complained an incensed George Gibier Rambaud. Physicians at the NYPI, he continued, waited two days for Procter to arrive when “we received a tip that our patient had fallen into the hands of the physicians of the Health Department.”⁹⁴

Rambaud then asserted an exclusive right on the part of the NYPI to treat out-of-town patients and argued that the Department of Health should limit itself to taking care of the city. His indignation reflected larger uncertainties and contestations over the proper scope and limits of public health, including pharmaceutical corporations’ complaints in the early twentieth century about what they considered unfair and improper competition from government manufacturers. Indeed, in 1902, corporate pressure forced the NYCDH to stop selling its diphtheria antitoxin to other municipal health agencies, but the Department of Health continued to produce and sell other biologicals, including smallpox vaccine and rabies vaccination kits, during an era without a firm consensus about the boundary between public and private enterprise.⁹⁵ In response to Rambaud, an unsympathetic Park retorted that his agency had

supplied serum or vaccine to patients “wherever they come from” for more than a decade. Those who needed rabies vaccination could expect it free of charge if they were New York City residents, “whether they be millionaires or paupers,” and for \$50 if they arrived from elsewhere. Health commissioner Thomas Darlington added, “If anyone comes to us for treatment, no matter who he is, rich or poor, as a matter of human kindness, we treat them all alike. Of course we charge for out-of-town patients; we are compelled to by law.” When told of the Pasteur Institute’s protest, he added, “I don’t know anything about it, and I care less.”⁹⁶

A major rabies outbreak in 1907–8 likely kept rabies vaccination at both the New York Pasteur Institute and the Department of Health’s Research Laboratory running at full capacity and lessened the economic pressures on the NYPI. As the *New York Tribune* reported in May 1908, “Dr. Park’s department and the Pasteur Institute have been overrun with persons who have been bitten by dogs, horses and rats.”⁹⁷ These circumstances did not prevent Rambaud from complaining to the city government about the Department of Health, which prompted a spirited response from commissioner Darlington. In a letter to the mayor in February 1908, Darlington denied any hint of unfair competition or other impropriety by his agency, and he contrasted the public-mindedness of the Department of Health’s rabies vaccination operations with the revenue-generating concerns of the NYPI. As Darlington put it, in a statement that exaggerated, perhaps deliberately, the private, profit-oriented motivations of the NYPI, “It is probably superfluous to state that the Pasteur Institute is a wholly commercial organization for the purpose of making money for its proprietors and stockholders. The Department of Health treats the people of the City free of charge, and cannot be said to enter into competition with it.”⁹⁸

Moreover, even if the outbreak of 1907–8 temporarily kept business at a high clip, as time went by, the health department’s growing patient load must have seriously affected the Pasteur Institute’s income. In addition, the development in the early 1900s of prepared injections with a prolonged shelf life made it possible for the health department to distribute preventive hydrophobia treatment by mail to private physicians, hospitals, and public health boards. By 1907, the NYCDH was sending out hundreds of vaccination kits a year through the postal service.⁹⁹ With this technical advancement well in place, in 1909, the New York State health commissioner recommended the establishment of a regularized, statewide system for distributing the shots, and New York City’s health department made clear its readiness for the task.¹⁰⁰ In

addition, other agencies elsewhere, such as the US Public Health and Marine-Hospital Service, also began to produce vaccination kits for use nationwide.¹⁰¹ Meanwhile, the NYPI remained a strictly local operation, likely in part because of the constraints of the Biologics Control Act of 1902. Back in the 1890s, Americans who wanted to undergo Pasteur treatment had to travel to one of perhaps three or so facilities around the country, including the NYPI. Now they could receive rabies vaccination at their own doctors' offices, or at other local institutions, and bypass the New York Pasteur Institute entirely.¹⁰²

Occasionally, the NYPI fought prevailing trends by promising specialized products, such as a new, stronger rabies vaccine from Paris that required fewer inoculations and a shorter course of treatment.¹⁰³ But with its monopoly broken, the single-purpose clinic that the NYPI had become had no way to remain viable in the long term. Lack of attentiveness on Rambaud's part likely did not help matters. For an extended period in the mid-1900s, he was absent much of the time, and physician William L. Wheeler took over the daily duties of administering treatment and fielding press inquiries.¹⁰⁴ In 1911, Rambaud also suffered serious injuries in an auto accident and faced a difficult recovery.¹⁰⁵ Two years later, he became embroiled in medical controversy when he agreed to become director of the Friedmann Institute, a clinic founded in New York City by a German researcher, Friedrich Franz Friedmann, who claimed to be able to cure tuberculosis with a serum derived from bacterial cultures in turtles. Medical observers had already denounced Friedmann as "unscientific" and even a "fakir," but Rambaud agreed to take charge of the institute in the interests of a full scientific evaluation. The Board of Health, however, shut down Friedmann's facility shortly thereafter, and the County Medical Society considered disciplinary action against Rambaud and three other physicians, although it seems to have tabled the matter.¹⁰⁶ Then with the start of World War I in Europe, the French-born Rambaud, who led a transatlantic life split between New York City and Paris, increasingly turned toward mobilizing physicians for the front.¹⁰⁷ Finally, in September 1918, the New York Pasteur Institute closed its doors for good, and Rambaud moved to France permanently after the end of the war.¹⁰⁸



The successive histories of rabies vaccination by the American Pasteur Institute, the New York Pasteur Institute, and the New York Department of Health underscore how American economic, political, and institutional settings combined with biological necessities to shape the integration of Pasteur treatment into New York City's systems for providing medical treatment and controlling

disease. The transfer of Pasteur's vaccination technique to the United States required not just technical know-how, but viable institutional strategies suited to the economic opportunity structure of the United States in the late nineteenth century. Even as the city became "pasteurized," Pasteur treatment became Americanized, as the system of high-level philanthropic and governmental support that evolved for the Pasteur Institute in Paris translated in the United States into Gibier's rising pharmaceutical empire during the era of American corporate capitalism's ascendance. Animals' bodies and the requirements for maintaining them also changed the spatial structures of pharmaceutical production, as companies relocated from the city to the countryside in order to accommodate the full range of domesticated animals needed by the industry in its early years. Shifting political and institutional circumstances played critical roles as well in determining the particular organizational conformations of rabies vaccination in New York City. Tellingly, as Pasteur treatment spread in the French context on the coattails of empire and imperial rule, its path in the United States navigated a fluid political, economic, and institutional environment of philanthropy, corporate enterprise, and emerging public health, in which private entities and public agencies experimented with different configurations of financing, self-defined missions, and outreach. With the failure of the Motts's philanthropic venture, followed by the rapid rise and decline of Gibier's ambitious sanitarium and biologicals enterprise, alongside the Department of Health's bold foray into vaccination as a legitimate governmental function, Pasteur treatment in New York City ultimately came to rely on state power in the form of municipal public health.

One should hesitate, however, to view the eclipse of the NYPI by the NYCDH as a simple story about the rise of expertise and the upward trajectory of the administrative state in early twentieth-century America. Although in rough outline the sequence of events suggested a shift from private to public authority, the relationship remained mixed. For example, just as the NYPI received limited government funding to support rabies vaccination for the indigent, the Research Laboratory enjoyed a certain amount of private philanthropy. As Anna Wessels Williams later recalled in her unpublished autobiography, Park solicited donations from "certain wealthy people, a Foundation or two, a big Drug Company and a Life Insurance Company." Reliance on skilled and energetic women denied full career opportunities to staff the laboratory as volunteers or underpaid employees could also be considered a type of privately supported provision of public health, based on women's de-

voted contributions of time and effort, as in so many other progressive projects at the turn of the century.¹⁰⁹

The next chapter details more fully how turn-of-the-century public health operated in a complex political environment, in which blended notions of public and private, rather than a strict delineation between the two categories, defined myriad aspects of everyday governance. From this perspective, the health department's competition with the NYPI and its confrontations with the American Society for the Prevention of Cruelty to Animals over rabies prevention and canine animal control mattered as far more than simply minor spats in the history of urban politics. Rather, the very nature of the public-private distinction and state power itself stood at stake.

Dogs and the Making of the American State

The Politics of Animal Control

In the summer of 1914, amid a rabies outbreak among the local dog population, New York City health commissioner Sigismund S. Goldwater railed against urban dogs as useless creatures that offered nothing but a public health threat. “Can you tell me,” he cried, “what dogs are good for in a city? In the country they are all right, but in a city they are a nuisance from the point of view of sanitation, and there is always the danger of rabies.” Goldwater called for a year-round muzzling requirement and a new, municipally run pound to address the problem. The American Society for the Prevention of Cruelty to Animals (ASPCA), which possessed the power to enforce the city’s canine animal control laws, immediately objected that it already possessed the capacity and expertise to deal effectively with stray dogs, and the society’s superintendent, Thomas F. Freel, hinted that the Department of Health held the more malign goal of ridding the city of dogs entirely.¹ In response, Goldwater directly attacked the ASPCA for its failure to adequately control strays. He declared, “You can quote me as saying that the Society for the Prevention of Cruelty to Animals does not cope with the situation confronting the city.”²

This exchange came toward the end of more than a decade of on-and-off confrontations between the ASPCA and the New York City Department of Health that grew out of ages of political contestations over loose dogs and the diverse approaches developed in order to contain the threat of rabies. From the early nineteenth century onward, canine animal control in New York evolved from a bounty system that expected private individuals to carry out duties of citizenship, to a reliance on municipally appointed dogcatchers as part of the political patronage network of the 1870s, to the transfer of authority over dogcatching and maintenance of the pound to the ASPCA. The long

history of municipal responses to the perpetual problem of loose dogs highlights the political challenges of animal control and the immersion of rabies prevention within the larger contexts of law, city government, urban reform, and, by the early twentieth century, an increasingly contentious political relationship between animal welfare advocates and public health professionals.

The stakes, however, involved not just dogs' place in the city and the protection of human health, but reached to the very heart of American governance. In particular, the history of canine animal control in New York City raises profound questions about the changing nature of the police power and the American state in the early twentieth century. Why did an ostensibly private, voluntary organization gain the power to enforce New York City's dog laws, and why did a municipal agency seek to take away that authority in the early decades of the twentieth century? What might this conflict tell us about the police power and the public-private relationship, and their place in American governance? The ASPCA was hardly exceptional in its exercise of the police power. Rather, its authority over canine animal control reflected the deep-seated entanglement of public and private in the United States. Rabies ultimately spoke not only to questions of human health, but also to the fundamental course of American political development.

The Police Power, the Public-Private Distinction, and American Political Development

Questions about the police power and the public-private distinction have long occupied scholars who study American law, politics, and public policy.³ Countless studies have demonstrated that a trend toward formalized, bureaucratized authority at the local, state, and federal levels characterized twentieth-century American political development, but few scholars have explored, or even recognized, how this shift coexisted alongside alternative configurations of the public-private relationship in a disorderly and heated process of negotiation and contestation that continues to this day. William Novak, however, has emphasized that to understand the American state and its evolution, one must look beyond federal executive power and instead confront the messy distribution of governmental authority in the United States in "an exceedingly complex welter of institutions, jurisdictions, branches, offices, programs, rules, customs, laws, and regulations."⁴ From that standpoint, according to Novak, the particular genius of the American state may lie in its multilayered, decentralized, infinitely divisible character, as opposed to the Weberian stereotype of expert-led, rationalized bureaucracy as the essence

of the modern state.⁵ Animal control is but one of innumerable areas of everyday public policy in which voluntary organizations continue to wield police power, perform public functions, and exercise state authority alongside formally constituted governmental agencies, at times in a spirit of partnership and at other times as intense rivals.

References to citizens' groups, particularly the challenge that charitable organizations, settlement houses, anti-vice societies, and other associations posed to patronage-oriented systems of municipal government, abound in studies of turn-of-the-century urban reform. Historians' assumption of a separation between public and private, or state and civil society, however, has frequently led them to treat voluntary organizations as purely external to the state and to limit their political roles to education, exhortation, and lobbying as means of changing public policy. In recent years, though, newer scholarship has developed a richer understanding of the interpenetration of civic groups and the state, including the blended nature of the public-private relationship.⁶ This latter set of insights highlights the importance of the historical developments that led to the ASPCA's acquisition of authority over canine animal control, as well as to the society's subsequent struggles with the Department of Health. Political battles over the management of New York City's dog population prompted conflicts over the nature of government and the appropriate roles of private and public bodies in the exercise of the police power.

To understand the workings of nineteenth-century animal control, one must recognize that the presumed separation between public and private was a product of specific historical changes and not a timeless quality of political theory.⁷ By the early twentieth century, the progressive mantra of expertise and formalized bureaucratic authority sought to supersede not just the urban political machine, but also a system of power defined by a porous boundary between state and society, in which voluntary organizations and other private entities carried out functions that served governmental purposes. Sometimes the project of statist expansion made headway, as in the Department of Health's decision to challenge the NYPI and turn rabies vaccination into a public health initiative administered by the state. In the case of the ASPCA, however, New York's health department failed to break the society's regulatory authority and police power. As we will see, although the health department's actions, as well as a series of court decisions related to the police power of animal welfare organizations, placed the society on the defensive, the ASPCA continued to issue dog licenses, enforce the dog laws,

and run the city pound all the way into the 1990s. The society's longevity as a private organization charged with public purposes provides just one example of how the transformation of the police power and the formalization of governmental authority that reshaped the American state in the early decades of the twentieth century did not replace an old order so much as it adapted and coevolved with it. The ASPCA acquired its policing and regulatory functions from a well-established political tradition in which citizens and private entities carried out the work of the state, and although it eventually ceded its oversight of animal control after a century, its share of the police power continues to the present day.

**From Bounty Hunters to Municipal Dogcatchers to the ASPCA:
Policing Dogs in Nineteenth-Century New York**

Dogs' presence on city streets mattered not just in terms of shaping everyday social life, but as a question of governance, in which the unwieldy urban animal order of the nineteenth century generated constant calls for stronger laws and stricter enforcement. On 11 July 1856, for example, the *New York Times* responded to reports of dog bite cases and one rabies death in nearby Paterson, New Jersey, with a vigorous tirade against dogs running loose on the streets of New York:

It is villainous that our pounds should be so little patronized, and such swarms of dogs allowed to run unmuzzled. . . . In a brief walk of not more than a third of a mile, yesterday, we counted no fewer than *twenty-seven* ugly yelping rascals, every one of whose snouts ought to, but did not enjoy the protection of a wire network. . . . There is talk of a rising of the people in imitation of the San Franciscans—of the appointment of a Vigilance Committee—of a grand mass meeting near the City Hall, to initiate a new dog-law—and hang those who have failed to execute the old one. . . . [Dogs] swarm in all the streets, obstruct the pavements, make night hideous with their howls, and have a worse name than Aldermen in New York.⁸

In addition to its commentary on the failures of city government and appeal to citizen vigilance (today more commonly known as vigilantism),⁹ the *Times*' editorial vividly depicted the frustrations induced by animals' contribution to the disorder of the nineteenth-century city. As elaborated back in chapter 1, an urban world of horse-drawn transportation, local slaughterhouses, backyard livestock animals both large and small, and free-range cats and dogs, along with the rapid expansion of the city itself and its human popula-

tion, created endless daily challenges. In response to the dangers and irritations of disease, bodily harm, and sheer nuisance from dogs on the loose, debates over animal control reflected larger struggles over how to regulate city life and ensure public health and safety in an age of intense class conflict and constant rumination over the threat of urban life to the cohesiveness of the social order. Consequently, New Yorkers argued vociferously about every aspect of urban existence, including the menace of the dogs that roamed the streets and the unsavory character of the persons charged with their removal. Animal control as a means of containing rabies was just one of a host of problems that raised larger questions about urban governance and the relative responsibilities of municipal governments versus those of citizens and voluntary organizations.

In order to manage rabies, New York City developed three successive systems of dogcatching prior to the early twentieth-century confrontations between the ASPCA and the Department of Health, and their history sheds light on the shifting configurations of private and public authority. Until the nineteenth century, American cities generally relied on private individuals to fulfill what were considered their civic obligations to protect public health and safety, as well as carry out other functions. As Hendrik Hartog has succinctly observed in the case of street cleaning in New York City at the outset of the nineteenth century, "Mobilizing an army of public servants would never have occurred to the members of the Common Council."¹⁰ In a rapidly growing urban environment, however, public needs soon outpaced the ability of private individuals to fulfill them. In May 1836, for example, the *New York Herald* pointed with alarm to a recent spree of mad dog sightings at Jefferson Market. "Why do not the Common Council see to these things?" the *Herald* demanded. The editorial immediately delivered its own answer: "Because they forsooth cannot decide betwixt tweedledum and tweedledee, the city must be the sufferer. Why is not the dog law enforced? Why are not the streets attended to? Why are not an hundred things attended to, which through stupidity or ignorance are neglected? Look to it, or we will." This final sentence contained both a summary of the existing state of affairs and a threat: citizens would not merely perform their public duties, but might take other aspects of law and governance into their own hands.¹¹

In response to the growing limitations of governmental reliance on private individuals, direct city employment spread to a wide variety of occupational categories in the first half of the nineteenth century. New York hired its first street cleaners in 1803 and appointed a city inspector in 1804; by 1860,

the city possessed an extensive bureaucratic apparatus, and it had taken direct responsibility for police, fire, education, and, to some extent, aid for the poor and needy. Where citizens had once carried out responsibility for policing through the night watch, for example, the police now became a municipal service.¹² Amid this renegotiation of the nature and functions of municipal government, however, private ordering persisted in the exercise of the police power and fulfillment of other public functions, particularly as urban reformers targeted what they perceived as inefficiency and corruption in machine governments. They offered, as alternatives, not just professional management and a new vision of expert-led, public administration, but also their own services. From the early 1870s onward, for example, the New York Society for the Suppression of Vice and other anti-vice organizations pursued the policing of public morality and enforcement of anti-obscenity laws in direct collaboration with city officials and the US Post Office, through the appointment of special agents who simultaneously held the imprimatur of federal authority and private organizational membership.¹³

One can trace this historical arc in the evolution of municipal government through canine animal control, which evolved from a decades-old bounty system that relied on individual initiative to a force of municipally employed dogcatchers in the 1870s, only to shift two decades later to the aegis of the ASPCA, a private voluntary organization. New York's dogs enjoyed complete freedom to roam until the early nineteenth century, when the mayor first ordered police captains to pay bounties of fifty cents for unmuzzled dogs turned in at police stations for dispatch during July and August, the summer months when rabies, according to popular mythology, was supposedly most prevalent. Ordinances authorizing the collection and disposal of unmuzzled dogs eventually became an annual summer ritual, supplemented by animal control measures taken in response to specific incidents of suspected mad dogs on the rampage throughout the year, along with the spontaneous decisions of individual citizens to chase down and kill seemingly dangerous animals when suddenly confronted in city streets.¹⁴ When bite victims went to court to demand owned dogs' destruction, as they frequently did throughout the nineteenth century, they also participated in an unstated form of animal control and not just the exercise of tort law.¹⁵ In terms of formally constituted municipal policy, the city sometimes hired dogcatchers to supplement the bounty system, and in 1850 New York established a Dog Bureau to patrol the streets and club to death dogs that posed a public menace. A year later, New York established its first dog pound, where "valuable dogs" at large could

find some respite and hope of being reunited with their owners, rather than face immediate destruction.¹⁶ Amid these institutional refinements, however, the annual dog bounty continued to be the primary municipal strategy for culling the dog population.

By the 1860s, urban reformers in New York launched increasingly vigorous attacks on the bounty system, which they viewed as a semi-criminal realm that was particularly threatening to the morals of children. Recall the account in chapter 3 of the rise of animal welfare advocacy in the United States. Animal protection movements evolved in a mid-nineteenth-century milieu of urban class formation in which anxieties about a world of anonymous strangers, especially immigrants with seemingly threatening mores, drove the creation of a new middle-class identity centered on the family. This novel conception of the middle class in turn redefined the social status of pets.¹⁷ Although an established, common law tradition that distinguished between useful livestock animals and creatures “kept for pleasure, curiosity, or caprice” had long recognized dogs’ primary role as pets, the rise of middle-class sentimentality transformed the status of household animals.¹⁸ By the 1820s, a domestic ethic of kindness to animals linked the treatment of pets and other creatures to the cultivation of Victorian gentility. Affectionate relations toward pets in the household reinforced the new middle-class ideal of intimate family life and, in particular, provided children the proper guidance in their development as moral beings.¹⁹ Within the broader class-laden context of the mid-nineteenth-century American city, animal welfare advocacy then melded with general efforts to improve civic morality and combat urban disorder. For middle- and upper-class urbanites who believed in an ethic of gentility, refinement, and order, dogcatchers and the boys who aided them represented yet another threat to their vision of the city.²⁰

The assault on the bounty system by supporters of animal protection richly illustrates the crossover between concerns about the humane treatment of animals and anxieties surrounding the morally corrupt character of urban life. Dogcatching was just one of numerous street trades open to children. In the 1850s, working men typically earned monthly wages of about \$25–30 but also faced considerable downtime because of seasonal or other cyclical employment patterns, while women in the sewing trades or domestic service earned just \$1.50 to \$2.50 per week, and poor families frequently managed to get by on as little as \$8–10 monthly. Under such circumstances, summer dog bounties could provide a significant supplement to the family economy, or to a boy’s own subsistence.²¹ From reformers’ perspective, however, the street

urchins and rough men engaged in dogcatching skirted the edge of criminality and occupied an underworld of vice and corruption. As early as 1848, "B." wrote to the *Herald* to warn of the moral hazards of placing money in the hands of "young barefooted vagabonds, of six to ten years old," who would surely use their canine-derived largesse "to supply themselves with liquor, tobacco and cigars—to take trips to Coney Island, and to indulge in vices heretofore only practiced by blackguards of a bigger growth."²² Nor did reformers believe the police necessarily provided disinterested public service. The city's bounty on loose dogs, as one observer put it in 1855, merely encouraged "vigilant (?) policemen and dirty urchins, ambitious of the reward of 50 cents given for every seizure."²³ The summer ordinances also prompted thefts of owned dogs, and stories of brazen attempts at canine theft while dogs accompanied their masters out on the town peppered the city's papers throughout the latter half of the nineteenth century.²⁴ As late as June 1892, "A Citizen" described such a case to the *New York Times*: "In a contemptible way the roughs whom the city pays to do this work stole up behind the man, seized the dog, and bore it away to their wagon."²⁵

Animal welfare advocates also worried endlessly about the moral hazards that dogcatching itself posed to urban youth. The dog ordinances were "clearly detrimental to the morals" of young people according to one editorialist in 1868, and the city wrongly addressed the "unmitigated nuisance" of loose dogs with "the agency of cruel and sordid boys."²⁶ In June 1874, the ASPCA's founding president, the tireless Henry Bergh, similarly targeted the bounty system for corrupting the morals of young people. "With a bribe of fifty cents," he warned darkly, "the idle youths of this City have been, in many instances, for the first time seduced into the temptation of stealing and betraying their friendly companions, the dogs." Bergh also attacked the pound's proximity to a nearby school, where he feared that "the screams of their condemned four-footed playmates might facilitate the scholars' acquisition of immorality, and prepare them for the State Prison and the gallows!"²⁷ Such dire forebodings typified the moral dangers that urban reformers perceived from virtually every street corner.

The ASPCA and its supporters responded at first by trying to reshape the bounty system around the edges, an approach that preserved a political system based on ordinary citizens' role in maintaining urban order. In 1860, reformers succeeded in lowering the dog bounty to twenty-five cents and restricting direct payments to adults in an effort to remove children from the dogcatching business. The measure backfired, however, by merely shifting

the advantage to dog brokers, middlemen who gave the street “boys” a fraction of the bounty and turned the dogs over to the city themselves at a healthy profit.²⁸ Such brokers already operated a regular trade, since it was easier for boys in the northern reaches of the city to transfer their captured booty immediately to third parties at a discounted rate than to haul the dogs down to city hall themselves.²⁹ In 1856, the *New York Tribune* described the dealings of one of these go-betweens, Jemmy O’Sullivan, who had “made considerable money by speculating in dog flesh” over a twenty-five-year period. The *Tribune* explained, “It was his custom, during the dog days, to hire a gang of boys to hunt dogs during the night and bring them to his cellar, where he bought them for twenty-five cents apiece, and asked no questions.” O’Sullivan’s line came to a grim end when he died from hydrophobia.³⁰ His fate did not deter others, however, and the prohibition against children collecting bounties further strengthened the brokers’ own economic position. By 1867, the annual dog market had become an oligopoly of sorts, in which “five men . . . monopolize most of the dog-killing business.”³¹

By the mid-1870s, at the tail end of an era in which city employees and bureaucracies increasingly replaced individual citizens in exercising governmental functions, dogcatchers appointed by the mayor supplanted the free market in canine roundups. The intervention of Tammany Hall, however, simply integrated the “Dog Ring” into the municipal patronage network. One aspiring dogcatcher, Charles P. Matthias of Morrissania, in the Bronx, even used blackmail to secure an official appointment. He threatened to release the sixty dogs he had already captured, some of whom he claimed “show symptoms of hydrophobia,” onto the streets of the city if the position failed to come through. According to one commentator, such was the character of “the candidate for dog-catching honors,” who barely concealed “the hand of steel under the glove of velvet.” But Matthias’s gambit apparently succeeded, and an alderman immediately invited him by telegraph to “come down to the Mayor’s office” and added reassuringly, “The city cannot lose your valuable services.”³²

Meanwhile, the pegging of earnings to numbers of dogs caught continued to motivate theft, and dogcatchers’ practice of paying children on the side to gather the canine goods also undermined the moral mission behind the dismantling of the bounty system. The seasonal employment lasted only a few months, but dogcatcher Jimmy Corrigan told the *Herald* that he could make as much as \$100 a day, which indicates how easily these members of the urban patronage network could afford to subcontract part of their work to

the city's school-age underclass. Moreover, reports of valuable animals stolen by city dogcatchers and held for ransom did nothing to improve dogcatchers' suspect image. One editorial writer pronounced in July 1883, "When the dog-catcher combines private speculation with public business and takes possession of a valuable dog, which is afterward 'found,' not at the pound but in a drinking saloon, he becomes more than a nuisance." That indignant observation drew a firm line between the respectability of the owners of valuable dogs (as opposed to mongrels or curs) and the disreputable persons responsible for dog collection whom one found in saloons, the ever-present bugbear of urban reformers, and other loathsome environments. Some shenanigans on dogcatchers' part might be tolerated as mere annoyances, but not when their actions and those of "the prowling small boy" who was "often as reprehensible as the professional dog-catcher himself" encroached upon the lives of decent citizens.³³

To the credit of Bergh and other ASPCA activists, they did not restrict their work on behalf of animals to social controls aimed at the poor and working class. They also targeted owners of horse-car and omnibus companies, researchers who employed vivisection, and enthusiasts of pigeon shooting, rabbit coursing, foxhunting, and other blood sports of the social elite. At the same time, the class conflicts of the nineteenth-century city also weighed heavily. At the root of animal welfare advocates' antipathy toward the bounty system and municipal dogcatchers, along with their dismay over the children involved in the dog market, lay a distinctly middle-class social vision of domesticity, sentimentality, and order.³⁴

By 1890, efforts to reform dogcatching had largely failed to remove children from the trade or to stamp out corruption. From critics' perspective, the urban machine's patronage system represented little more than a rearrangement of the public-private relationship that, in their eyes, improperly allowed public resources to go to the benefit of private individuals under the guise of public authority and to enrich those persons in the process. As the *Brooklyn Daily Eagle* acidly commented during the latest round of canine-centered patronage appointments in the summer of 1877, "By and by the genius of the tail will assert itself, and some process will be discovered by which dog catching will become a valuable business, from which its exponents will retire with independent fortunes."³⁵ But in a context of vastly increased activism by reformers on a variety of fronts in 1890s New York, the ASPCA found new political opportunities. In an era of progressive political innovation, the

society now sought to extend the police powers that had characterized its anti-cruelty efforts from the beginning.³⁶

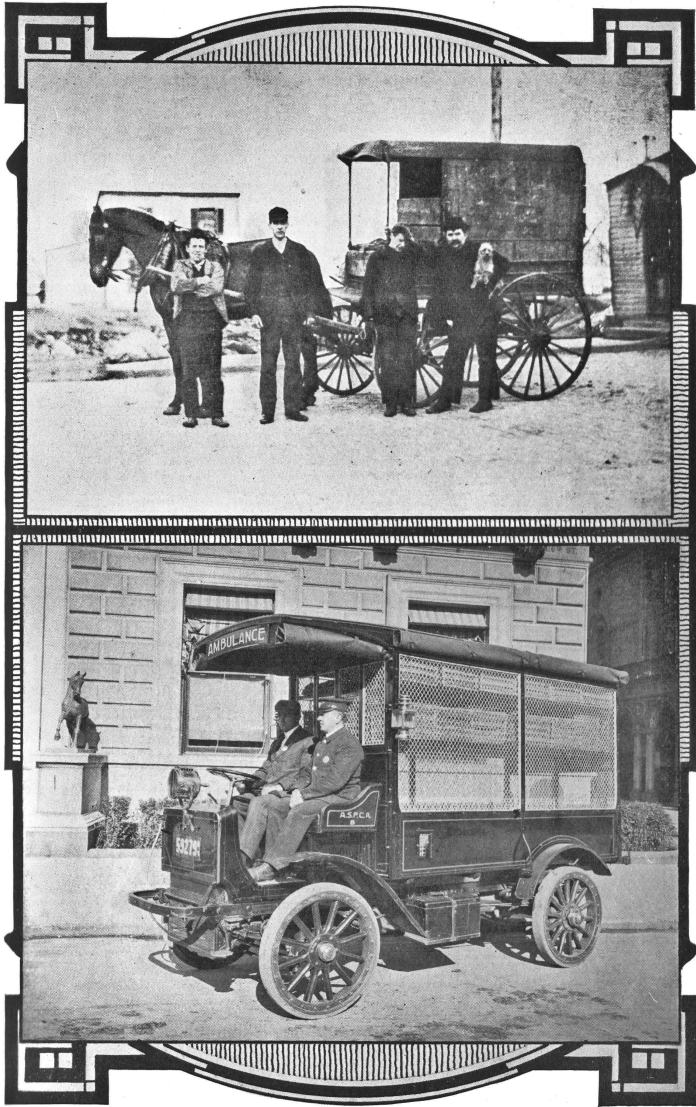
Back in 1866, shortly after its founding, the ASPCA obtained a formal role in animal protection, under state laws that charged police in New York City and elsewhere in the state with the duty to aid the ASPCA in its enforcement of animal protection laws, and that also allowed half of fines “collected through the instrumentality of the society, or of its agents, for violations of such laws” to “accrue to the benefit of said society.”³⁷ The following year, additional revisions in the law expanded the definition of cruelty toward animals in a range of situations, and the enhanced animal welfare legislation explicitly granted enforcement powers to ASPCA agents in addition to designating that all fines collected would go toward the society in support of its animal protection work. This arrangement granted the society significant governmental authority from the outset. As Susan J. Pearson has written, the ASPCA and other animal protection societies “wielded not just philanthropy but state power; they distributed arrest warrants rather than alms.”³⁸

From this starting point of enforcement of the anti-cruelty laws, the ASPCA branched outward in new directions, including canine animal control. As early as 1873, Bergh appealed to the city government to support an ASPCA-run pound that could deal with the dog problem without the unseemly practice of clubbings in the street or the immorality-inducing public drownings that provided, as the *New York Herald* phrased it, “a weekly entertainment of the most enlivening character to every gamin about town.”³⁹ The following summer, amid the news of the deaths of Francis Butler and William McCormick that sparked the 1874 rabies scare in New York City, City Hall persisted with the summer dog bounty. In addition to attacking the bounty system, Bergh began to monitor conditions at the city pound, and he soon threatened to charge the poundmaster with violation of the state’s anti-cruelty laws. Meanwhile, a grand jury backed Bergh’s attack on the bounty system and the pound’s location in the vicinity of a school by recommending that the city relocate the pound and replace dog bounties with hired dog-catchers. Around the very same time, the city pound tried shifting to gas as a more humane alternative to drowning, but when initial attempts resulted in long, drawn-out deaths for captured dogs, the ASPCA obtained an arrest warrant against poundmaster John Marriott for “willfully and wantonly tormenting ninety living dogs” in a botched execution. In police court several days later, the presiding justice heard competing accounts of whether or not

the dogs had suffered a cruelly protracted demise, and he took the matter under advisement. Apparently Justice Murray ultimately declined to have Marriott held over for trial, but the embattled poundmaster was sufficiently chastened by the experience that he actively solicited Bergh's advice in the next round of dog killings. After further tinkering, the new system for canine euthanasia finally operated satisfactorily in early July.⁴⁰

In the short term, the conflict over the dog bounty and the pound did not produce an official transfer of power to the ASPCA, despite Bergh's continued efforts. Instead, the city moved the pound as recommended, and it turned to the patronage-centered system of appointed dogcatchers despite political pressure from the ASPCA.⁴¹ But by the mid-1890s, at a time when a broad range of social reformers succeeded in earning public attention and growing political power to deal with problems of urban growth and industrial society, the ASPCA forged new opportunities. By then, the society possessed a well-established record of wielding the police power in the area of animal protection, and its leaders pushed successfully to take over the city's dogcatching functions. Under new state laws, the society gained authority over lost animals and strays in New York in 1894 and in Brooklyn the following year. New York City closed the municipal pound, and the ASPCA opened a new facility. Legislation also granted the society authority to administer dog licensing in order to fund its enforcement of canine animal control, and the ASPCA fielded its own force of salaried dogcatchers, whose police-like uniforms added an air of discipline and authority. With this new system of institutional and administrative power, the society ended the system of dog brokerage and theft that had prompted public complaint for decades.⁴²

At one level, the struggle between animal welfare advocates and the city government constituted a typical conflict between reformers, with their vision of virtuous leadership by private citizens, and the urban machine, with its patronage politics.⁴³ But the ASPCA, in obtaining the power to administer New York City's animal control laws, also managed to rearrange canine animal control while maintaining a blending of public and private authority. The granting of law enforcement powers to a private, voluntary association might seem unusual, but it was par for the course in the nineteenth century. The ASPCA's original acquisition of the right to enforce new anti-cruelty laws in 1866 was but one manifestation of what William J. Novak has called "the well-regulated society." More generally, the intermingling of public and private power meant that citizens and local governments did not hesitate to pursue building regulations, sanitary measures, the eradication of nuisances,



From the annual report of the American Society for the Prevention of Cruelty to Animals, 1915: The unruly dogcatchers of the urban patronage network in the days of yore (*above*) versus the orderly, disciplined modern dogcatcher (*below*). *American Society for the Prevention of Cruelty to Animals Fiftieth Annual Report, Year Ended Dec. 31, 1915* (New York, 1916), 23.

and other efforts in defense of the public welfare.⁴⁴ The passage of the infamous Comstock law in 1873, for example, and Anthony Comstock's construction of a powerful alliance among local anti-vice organizations, municipal police, and the US Post Office to root out obscenity in all forms that the self-appointed morality police saw fit, dramatically illustrates citizens' participation in the policing of New York City.⁴⁵ Urban historians have paid less attention to the police work of the ASPCA, but the society launched more than a hundred anti-cruelty prosecutions in 1866, and by the 1870s and 1880s, it was pursuing thousands of cases every year.⁴⁶ Like Comstock, Bergh also aggressively expanded the delegated authority granted to him and his society under the law. As the *Herald* observed of Bergh upon his death in 1888, "Assistant District Attorney for life, and assistant to the Attorney General, he was enabled to wield tremendous powers, and, rightfully or wrongfully, he never hesitated to make use of the opportunities thus afforded."⁴⁷ The ASPCA's vigorously executed statist functions continued apace in the post-Bergh years. In the 1890s, when the ASPCA-run system of animal control replaced what the *Tribune* colorfully termed "the wild buccaneering character of the calling of the dog-catcher under the old days," animal welfare advocates' newfound authority over dogcatching and the pound rested on nearly thirty years of experience with the exercise of the police power.⁴⁸

The ASPCA proudly heralded the success of its animal control operations and the disciplined performance of its dogcatchers. As ASPCA president John P. Haines reported triumphantly at the society's annual meeting in December 1899, "The streets of New York are no longer infested by homeless dogs, and the nights are no longer made hideous by half-wild cats."⁴⁹ The public image of dogcatchers changed rapidly from that of rough men dealing in strays and harassing legitimate dog owners to an image of dogcatchers as, at worst, colorful rogues.⁵⁰ But the ASPCA's monopoly over dogcatching remained uncontested for less than a decade. In the early twentieth century, the Department of Health's push for muzzling requirements as an anti-rabies measure quickly erupted into direct conflict with animal welfare advocates.

Voluntary Organizations versus Bureaucratic Authority:

Confrontations between the ASPCA and the Department of Health

As discussed in the previous chapter, news of Pasteur's development of rabies vaccination spread rapidly in the fall of 1885. Initially, the New York City Department of Health continued to deal with rabies in much the same way as it had for the previous two decades, by performing the routine work of

administering the annual ordinance, keeping statistics, and responding to dog bite complaints, but not undertaking concerted efforts against rabies. By the mid-1890s, with the privately run New York Pasteur Institute in charge of delivering Pasteur treatment and the ASPCA now gathering loose dogs and running the pound, the parallel efforts of the two organizations defined an urban system of rabies control and prevention carried out primarily by voluntary organizations, and not the city's public health officials. Within a few years, however, the municipal health bureaucracy's newly developed capacities in the production and administration of rabies vaccine, the rapid diagnosis of rabies, and animal inspection paved the way for a series of public clashes over New York City's dog problem that established the health department's legitimate authority over rabies prevention, but also preserved the ASPCA's responsibility for overseeing canine animal control.

The Department of Health's determination to tackle rabies prevention more broadly, and not just through the provision of Pasteur treatment, stemmed from a range of scientific, political, and institutional developments that allowed public health departments to reach new levels of activity and authority in the 1890s. Under nineteenth-century jurisprudence, public health constituted the foremost rationale for the exercise of the state's police power and regulatory authority, and municipalities did not hesitate to order protective measures through the citizen-oriented, frequently ad hoc means that defined governance in the early national period.⁵¹ Systematic, long-term, and bureaucratically based enforcement arrived in the context of municipal governments' expansion in the mid-nineteenth century. New York City's Metropolitan Board of Health, founded in 1866 and reorganized with new powers as the New York City Board of Health in 1870, immediately earned a lofty reputation for stemming the spread of the 1866 cholera epidemic, and it quickly became the model for new health departments in Chicago, Milwaukee, and other American cities.⁵² Urban and state-level health boards generally experienced rocky fortunes in the 1870s and 1880s as sanitary reformers grappled with the vicissitudes of party politics and the challenges of demonstrating their ability to deliver healthier conditions.⁵³ From the 1890s to the 1910s, however, the dissemination of germ theory, the growing power of the laboratory, and the rising political heft of social reform movements helped public health departments to launch increasingly determined efforts to combat infectious disease, reduce childhood mortality, improve sanitation, rein in the nuisance trades, ensure greater food safety, and pursue myriad other programs on behalf of the public's health.⁵⁴

In this context of the growing political and institutional reach of public health, rabies now mattered to the New York City Board of Health, not because the disease posed a threat any more serious than in the past, but because, as detailed in chapter 5, ambitious public health officials expanded the work of the laboratory and of animal experts to incorporate rabies prevention into their agency's functions. Through diagnostic techniques, vaccination, and animal inspection, the department developed an extensive bureaucratic network that made rabies into one of its central administrative concerns. Only then, and not before, did New York City's public health bureaucracy decide that dogs on the loose constituted a problem that required its vigorous intervention. Whereas the health department had previously been content to leave canine animal control to the mayor's office or the ASPCA, it now sought to extend its purview.

The department's newfound commitment to rabies prevention soon led to conflicts with the ASPCA, as public health authorities sought additional restrictions on urban dogs that violated animal welfare advocates' precepts of humane animal control. Diverging worldviews paved the way for the clash. In the past, although public health professionals and animal welfare advocates differed over the significance they accorded to sentimental attachments toward animals, they agreed on the necessity of removing strays from city streets, and they shared a reform agenda aimed against political corruption in the provision of city services. Animal welfare advocates' primary concern lay in protecting dogs from what they saw as the cruelty of life on the street, with public health a distinctly secondary benefit of animal control, but that commitment served the Department of Health's objectives well enough in the 1870s and 1880s. The rise of bacteriology and its reliance on animal experimentation and usage, however, drove a wedge between the two groups. In the earlier discussion of hydropathy as a rabies remedy, we saw how animal welfare organizations' tendency to minimize the danger of hydrophobia and to recommend vapor baths over Pasteur treatment constituted one source of rancor that fueled public health professionals' frustrations with the ASPCA's approach to animal control. By the end of the nineteenth century, health officials and the ASPCA had already wrangled over access to at least one dog's body for rabies testing via inoculation of rabbits. Just as the Department of Health had accused the New York Pasteur Institute of operating out of suspect financial interest, animal welfare advocates also accused vaccinators in general of acting from selfish pecuniary motives. As *Our Animal Friends* noted in May 1899, "There are men who have a moneyed interest in the dread

of hydrophobia. It is their trade to prepare the serum of the so-called Pasteur treatment.”⁵⁵

The use of muzzling for purposes of hydrophobia prevention became another wellspring of division in which medical opinion collided with animal welfare organizations’ understandings of animal cruelty. The first major skirmish came in 1903, in response to the death of physician Henry P. Loomis’s 8-year-old son from rabies in mid-March. The sad circumstances convinced Loomis, previously a confirmed skeptic, of the reality of hydrophobia. In addition, the heartrending news prompted a spate of commentaries on the need for improved control of the city’s dog population, along with an outpouring of letters to the Board of Health, and health commissioner Ernst J. Lederle immediately announced new efforts by his department to investigate the state of canine animal control in New York City.⁵⁶ Then, in early April, at a meeting of the Bellevue Medical Association, Harry D. Gill, veterinarian for the New York State Department of Agriculture, excoriated the ASPCA for its “ignorant methods” and insufficient handling of New York’s dog problem. Gill then added that authority over canine animal control rested more properly with the Department of Health than with a private body. “It is high time,” he declared, “that this question should be taken out of the hands of a private corporation and placed under the municipal control of the Health Department.”⁵⁷ John P. Haines, president of the ASPCA, retorted that it would be better to “muzzle these rabid people” and rein in exaggerated fears. “Muzzle the sensationalists instead of the dogs,” he said, “so the people can calm their nerves.”⁵⁸ Gill answered back just as intemperately, by blasting the ASPCA for its inadequate enforcement of dog licensing and its “disregard for the facts of the medical profession concerning rabies.” He then threatened to have the state agriculture department weigh in on animal control in New York City.⁵⁹ Days later, medical experts and dog lovers faced off at the Board of Aldermen’s hearing on a proposed dog-muzzling ordinance to replace the simple leash law then in force. Gill and George Gieber Rambaud both testified in favor of the measure. The New York Academy of Medicine and leading New York medical journals lent their backing as well, and the Board of Health also passed a resolution of support.⁶⁰

The debate over muzzling starkly illustrated the different attitudes of animal welfare advocates and public health experts toward rabies and animal control. Haines apparently regretted his combative tone in response to Gill, and he soon published a more nuanced statement of the ASPCA’s stance. The organization’s position, he contended, did not rest “on merely sentimental

grounds.” In a refrain typical of animal welfare societies, Haines acknowledged the horror of rabies, but he also emphasized the disease’s extremely low incidence. Muzzling, he insisted, was both cruel and also unnecessary as an anti-rabies measure. The previous summer, *OAF* had explained that during the hot summer months when dogs needed most to cool themselves by panting and to freely slake their thirst, muzzling constituted a form of torture.⁶¹ To readers of the *New York Times*, Haines insisted that the city’s existing leash law, if strictly enforced, would provide effective rabies prevention without the suffering that came with muzzling, which caused dogs extreme “distress” and “nervous excitement.” The ASPCA president recalled one dog who went so far as to “tear at the muzzle with such violence as to lacerate its whole face and actually tear the claws out of its own feet.” Haines stressed that had no effective alternatives existed, the ASPCA would have conceded the necessity of muzzling despite its cruelty. But if owned dogs were leashed rather than being allowed to roam on their own, then existing animal control measures could deal with the strays.⁶²

Haines made a solid enough case, but physicians and public health experts differed. A gradual shift in medical opinion on the utility of muzzling provided one basis for the division. Back in the 1860s and 1870s, animal welfare activists and physicians, including members of the Board of Health, generally agreed on their opposition to muzzling, and Henry Bergh easily drew upon a range of medical authorities to argue that muzzles increased dogs’ likelihood of contracting rabies, because they upset the canine constitution through dehydration, overheating, and stress.⁶³ For example, Charles P. Russel’s extensive 1874 report on hydrophobia, written for the Department of Health, pronounced muzzling as “both injurious to the poor brutes upon which it is imposed and without efficiency in protecting the public against the danger intended to be thus averted.”⁶⁴ Although Russel rejected the theory of some veterinary and medical experts that muzzling might lead dogs to develop rabies spontaneously, due to the madness induced by thirst and acute discomfort, he did believe that muzzling might lead to active cases in dogs already infected. Russel explained as follows:

Any serious functional derangement, and particularly impairment of the nervous system, is directly instrumental in disturbing and liberating the rabific virus from its local tissue-union in the cicatrix, when, under ordinary conditions of health, the period of incubation might have been indefinitely prolonged. . . . Every muzzle more or less embarrasses the respiratory function

and buccal transpiration of the creature wearing it, and creates frequently a condition of great nervous disorder in an animal of such peculiarly excitable temperament as the dog. I have no doubt, therefore, that its use sometimes leads indirectly to the development of rabies, and thus renders dangerous an otherwise inoffensive brute.⁶⁵

Russel's somatic explanation, which proposed a physiological mechanism to explain the operation of constitutional disturbances, showed how muzzling seemed to pose a higher likelihood of actually causing hydrophobia than of preventing it. As acceptance of germ theory became increasingly widespread, however, medical and health professionals deemphasized constitutional concerns with irritation and bodily imbalance in favor of microbial understandings of infection and disease control. Although some doctors at the turn of the century still believed in constitutionalist arguments against muzzling, most physicians and public health advocates swung in favor of muzzles as an anti-rabies measure that could prevent transmission of a microscopic disease agent.⁶⁶

The medical and public health communities raised other objections to Haines's position as well. The ASPCA's arguments assumed full removal of loose dogs from city streets, while Gill and other critics alleged that the society consistently failed to fulfill its mandate. Animal welfare organizations' consistent attacks on vaccination also set off alarm bells for medical and public health professionals, who responded by regularly denouncing the ASPCA for valuing animal protection above human life. These gaps in attitudes gradually strengthened New York health officials' determination to contest animal welfare advocates' power over management of the urban dog population.

For the short term, the ASPCA succeeded in protecting its prerogative as the primary enforcer of the city's dog ordinances. An earlier draft of the proposed ordinance envisioned universal muzzling of all owned dogs, as well as placing enforcement authority with the police department rather than the ASPCA, which initially declined to take responsibility over the dog-muzzling mandate. The final version, however, required muzzles only for owned dogs out on their own, while dogs under human control could be led on a leash. The ASPCA agreed to enforce the ordinance, but the society also warned that the new requirement was only the first step of the "dog haters," who might eventually make certain that "the keeping of dogs in New York" would be "altogether prohibited."⁶⁷

The debate of 1903 failed to resolve the issue, and five years later, during

an ongoing rabies outbreak in the summer of 1908, the ASPCA and the Board of Health faced off directly against each other. The board started the year with renewed determination to remove stray dogs from New York's streets. At the end of January it passed a sharply worded resolution that condemned stray dogs as "a public nuisance dangerous to life and detrimental to health," prohibited dog owners from allowing their charges to run loose, and ordered the removal of strays to city shelters. A second resolution cited twenty-eight human deaths from hydrophobia in 1907 and called for a special appropriation of \$15,000 to round up and dispose of stray dogs, treat persons suffering from dog bites, and hire bacteriologists and other personnel required to enforce the dog ordinances.⁶⁸ In April, ASPCA superintendent Thomas Freel's statements that rabies was largely a disease of the imagination stirred up further controversy and likely increased health officials' eagerness to displace the ASPCA.⁶⁹ At the end of May, health commissioner Darlington asserted the Board of Health's "enormous, almost unlimited powers" to deal with the city's dog problem, although to city dwellers who feared excessive government intervention, he reassuringly added that "we wish to be conservative in exercising [these powers]."⁷⁰ On 17 June, the board issued leashing and muzzling requirements to last through October and mandated the destruction of dogs at large. The Department of Health had recently lost one of its own to hydrophobia, after the death of Edward Rabey, who captained a quarantine fumigating steamer, so perhaps the edict came with strong sentiments attached. Pending discussions with the ASPCA, the board temporarily suspended a provision that allowed the immediate killing of loose dogs, but at the end of July, it authorized the establishment of a special police force to shoot all unleashed, unmuzzled dogs, whether or not they were licensed or owned.⁷¹

The shoot-to-kill order quickly fomented a public uproar. The ASPCA immediately questioned whether the board had exceeded its discretionary power, and the society's president, Alfred Wagstaff, declared the measure "inhumane, unnecessary, in violation of the rights of owners, and a menace to public safety." He indicated that the society would seek judicial review, and a few days later, he made his case before the Board of Health.⁷² The *New York Times*, which had long criticized seasonal hysteria and ridiculed animal control measures applied only in the summer, also objected to the health department's exercise of discretionary authority: "Dr. Walter Bensel [the sanitary superintendent] appears to act on the assumption that, because the Health Department of this city has power to do almost anything in the real or

fancied interest of the public health, it should therefore exercise its power to the insane extremity. Unless wielded with discretion and judgment, extreme discretionary powers will certainly be curtailed.”⁷³ Even in an era of expanded bureaucratic authority, public health officials were skirting the limits of their prerogatives. Meanwhile, defenders of dogs also roundly condemned the dog-killing policy on humane grounds. Walter A. Dyer, managing editor of *Country Life in America* and future author of numerous warmhearted books about dogs, went so far as to suggest in a letter to the *Times* that those who carried out the board’s orders “could as easily be hired to garrote their poor, old, lame aunt, if she showed symptoms of mumps, which is contagious.”⁷⁴

The deaths of two well-bred, owned, and well-loved dogs heightened further the political pressure on the Department of Health. On 4 August, a policeman shot and wounded a stable owner’s Dalmatian. When the injured animal retreated to the stable, the policeman gave chase and finished her off. C. J. Fendt, the dog’s owner, objected to the cruelty of his “well bred and well kept” dog’s death. Witnesses, he added, “say it was most pitiful to see the way the poor dog begged to be spared.”⁷⁵ The ASPCA launched an investigation, and days later, it charged policeman John J. Fitzpatrick with wanton cruelty in the death of Fendt’s dog.⁷⁶

On the same day that the society issued its summons against Fitzpatrick, reports appeared of another noteworthy dog killing. On 9 August, the former assistant US attorney Harry Perry Disbecker and Billy II, his prize bull terrier valued at \$1,000, were on their way to a friend’s farm in the countryside. Billy II was wearing a license tag, but no muzzle, when he was shot and killed by someone whom Disbecker identified as a plainclothes policeman. Disbecker, cane in hand, angrily took a swipe at the shooter, who retreated and disappeared into the nearest subway entrance, leaving Disbecker to take poor Billy to the country for burial.⁷⁷

In a culture where sentimentality toward pets as beloved family members had become well-established in middle-class homes by the mid-nineteenth century and had only grown stronger and more widespread with each passing decade, the two dog killings created a public relations debacle for the Board of Health. A growing pile of hate mail reached the board, and sanitary superintendent Bensel and health commissioner Darlington both received death threats. Rumors swirled that the Board of Health would rescind its order and “recommit the matter of killing dogs” to the ASPCA. The case against policeman Fitzpatrick added to the pressure, but Darlington dug in his heels and defiantly announced that he was “determined that this order of

the board shall be carried out to the letter, no matter who opposes or what Col. Wagstaff, the S.P.C.A., or anybody else says.”⁷⁸

In the midst of the controversy, the ASPCA also belittled the health department’s claims about the benefits of the special dog-killing order and countered that the society destroyed dogs more efficiently and humanely, and in far greater numbers, than the Board of Health’s police squad. The ASPCA counted more than 27,000 small animals put down “humanely and painlessly” the previous month, as opposed to the hundred or so dogs dispatched daily under the health department’s shoot-to-kill order, according to sanitary superintendent Bensel’s figures. From the animal welfare perspective, although the health department claimed ultimate authority over animal control for public health purposes, in practice, it lacked both the capacity and experience to round up dogs in numbers comparable to those of the ASPCA. “Small animals,” however, included both cats and dogs, with the latter as little as 20 percent of the ASPCA’s total. Thus the society was destroying dogs at a rate of perhaps 5,500 per month, as opposed to 3,000 or so for the Department of Health’s policy in 1908.⁷⁹ Health officials did not dispute the ASPCA’s numbers, however, and in mid-August, after a magistrate ruled that Fitzpatrick had acted within the bounds of the Board of Health’s prerogatives, the board decided to declare victory, cut its losses, and deny that it had ever sought widespread destruction of people’s pets.⁸⁰ Now that city residents were taking extra care to prevent their dogs from running loose, the board could allow the dog-killing order to expire quietly at the end of October, as originally planned. Meanwhile, lest anyone brand Darlington a dog hater, the health commissioner let it be known that he and his staff loved animals as much as anyone else. As the office cat rubbed herself against him, Darlington regaled a reporter with stories about his bug-hunting fox terrier, whom he kept in the country, where dogs properly belonged, rather than muzzle him in the city.⁸¹ Finally, in its annual report for 1908, the Board of Health recorded its crack-down on dogs at large as a triumph and attributed a significant drop in numbers of dogs diagnosed with rabies “chiefly to the active crusade carried on by the Health Department.”⁸²

Six years later, the Board of Health again took aggressive measures against stray dogs and confronted once more the animus of the ASPCA. In July 1914, in response to another rabies outbreak, health commissioner Sigismund S. Goldwater sought more vigorous animal control measures. Cases of rabies detected in dogs during the first five months of the year in Manhattan and Queens nearly matched the numbers of cases in those two boroughs for all of

1913, and Goldwater called for a year-round muzzling requirement and a new municipal dog pound to curtail the threat. As described at the outset of this chapter, his pronouncement prompted heated exchanges with the ASPCA, and it sparked a vigorous debate among city residents. In a familiar response, animal welfare advocates denounced the cruelty of muzzling, charged the health department with exaggerating the threat of rabies, and accused the health commissioner of seeking to turn New York into a “dogless city.”⁸³ On 16 September, Goldwater responded at length by dismissing his critics as “a few persistent and wrong-headed individuals” who were able to “make a very loud noise,” and he argued that 99 percent of New Yorkers were on his side. Goldwater also pointed to the needless human deaths that resulted from the city’s failure to take the problem of stray dogs seriously. “If the Department of Health had done its duty fifteen years ago,” he declared, 121 deaths from rabies could have been avoided. He continued, “There should be no deaths from rabies, or from any other disease which can be as readily prevented.” Goldwater added that he was fond of dogs, but he “would willingly see every dog in America swept into the sea rather than sacrifice one precious human life.”⁸⁴

In contrast to the confrontational stance of commissioner Darlington and the Department of Health in the summer of 1908, however, Goldwater struck a conciliatory note as well. When critics fired off their broadsides to the mayor’s office, Goldwater carefully explained the department’s position. For example, he told Mrs. A. J. Wells, secretary of the Woman’s Republic Club, that the department sought “to interfere as little as possible with the liberties of citizens,” but the circumstances required action, and most of the mayor’s correspondence “indicate clearly that the sentiment of the community is overwhelmingly in favor of the abolition of rabies by whatever means appear to be necessary.”⁸⁵ Such outreach, he informed the mayor’s office, yielded positive results. “A few ladies,” he wrote, “have misunderstood the attitude of the Department toward the dumb creatures they love so well, but in almost every instance where an opportunity has been afforded to make a direct explanation, the ladies have ultimately recognized the justice and indeed the necessity of what the Department is doing.”⁸⁶ Although his remarks betrayed a popular tendency to dismiss animal welfare advocacy by equating it with women’s sentimentality, they also revealed a savvy bureaucrat hard at work and shaping a constituency for his agency’s policies.⁸⁷

Goldwater made certain his office replied in a similar vein to other critics. Responses highlighted broad public support for the Department of Health’s

anti-rabies measures and explained that data on dog bites demonstrated the inadequacy of leashes alone to protect the public.⁸⁸ In his statement on 16 September, Goldwater also threw a bone to the ASPCA. Dog owners, he said, had rightly pointed out that strays constituted the primary source of rabies, and to contain that threat, the health department looked to “the active cooperation of the American Society for the Prevention of Cruelty to Animals, which must increase its field work.”⁸⁹ All responsible citizens, the health commissioner indicated, could contribute to the rational management of the city’s health, as long as they submitted themselves to public health officials’ oversight and guidance.

Goldwater’s political work paid off. As he reasserted his determination to eradicate rabies from the city, rumors circulated that the mayor was about to demand his resignation. The mayor instead publicly and resolutely backed his health commissioner.⁹⁰ Public opinion toward the department also seemed more favorable than it had been in 1908, despite the concerns of dog owners and supporters of animal protection that Goldwater planned a general crusade against urban dogs. The *New York Times*, which had long advocated a year-round dog ordinance, applauded Goldwater’s measures and, in contrast to its assessment of the dog kill order six years earlier, did not contend that the board had exceeded its proper bounds.⁹¹ The Board of Health also earned backing from important professional communities, including the president of the Veterinary Medical Association, who publicly lauded Goldwater’s efforts at the organization’s annual meeting.⁹² Although a newly founded Dog Lovers’ Protective Association mobilized to push for leashing as an alternative to muzzling and charged Goldwater with wanting to make New York into a dogless city, the tide had already turned in public health officials’ favor.⁹³

Over the next few years, the Board of Health triumphantly reported dramatic declines in the number of rabid dogs found on city streets and a concomitant reduction in human deaths from hydrophobia. As the board observed in its annual report for 1915, “Better control of dogs and almost complete prevention of human rabies, have followed the co-operation of the police and the Courts in the enforcement of the muzzling and removal ordinances and a considerable publicity campaign.”⁹⁴ The following spring, the health department launched a publicity blitz and an initiative to arrest and fine owners of unmuzzled dogs as a way to maintain vigilance, and it reported salutary results. Not only did New Yorkers suffer fewer dog bites in 1916, but the department identified and destroyed just 23 rabid dogs, as compared to the already low number of 115 the previous year.⁹⁵ In 1917, New York experi-

enced only three human deaths from hydrophobia, and none of the cases originated from rabid dogs in the city that year: two of the three victims came from outside New York, and the third, from Queens, had been bitten the previous year.⁹⁶ The following year witnessed no human rabies deaths at all, a pleasant fact that the Department of Health attributed to “the thoroughness with which the muzzling ordinance is enforced, the result of prompt local treatment of wounds inflicted by suspected animals, and the thorough and prompt Pasteur treatment carried out in appropriate cases by this bureau.”⁹⁷ Professional and bureaucratic authority, it seemed, had emerged victorious over rabies.

The Police Power and Public-Private Accommodation

The Department of Health’s rendering of events, however, tells only part of the story. Closer attention to conflicts over the nature and scope of the police power disrupts a tidy narrative about the ascendance of expertise and bureaucratic authority in at least two respects. First, it exposes how legal developments, and not just the ability to mobilize laboratory science, aided the public health bureaucracy’s efforts to gain greater authority over rabies prevention and treatment. Second, and more significantly, it underscores the limitations of the Department of Health’s ability to monopolize authority over canine animal control in New York City. In the early twentieth century, especially during the era after the *Lochner v. New York* (1905) decision, the ASPCA faced new legal challenges to its dog licensing and animal control prerogatives. In *Lochner*, the US Supreme Court famously ruled that a state law to protect bakers’ health by limiting their work hours violated freedom of contract, and ever since, standard analyses have identified the decision with a new political and legal order that privileged an extreme conception of individual economic liberty over nineteenth-century interpretations of the police power and its broad exercise for the public good. *Lochner*’s strictures on the police power for the purposes of protecting public health and safety were far from absolute, however. The courts ultimately preserved legal space for the ASPCA’s law enforcement functions, which produced an accommodation between the Department of Health and the ASPCA, rather than the outright victory of bureaucratization and professionalization. The ASPCA retained its share of the police power, as part of a political ordering that continued to blend public and private authority.⁹⁸

From the ASPCA’s perspective in the 1900s and 1910s, however, its hold on canine animal control was far from certain. The Department of Health’s ef-

forts to wrest dogcatching and rabies prevention away from the ASPCA coincided with legal changes that also threatened the society's hold on public authority. In February 1901, the New York State Court of Appeals, the state's highest court, ruled unconstitutional a law that granted local animal welfare organizations the power to issue dog licenses. The decision in *Fox v. The Mohawk and Hudson River Humane Society* cited a vagueness in the statute that amounted to a taking of "money or property from one citizen and its appropriation to another for its private use," which violated the proper application of the power of taxation. The court also identified an unconstitutional grant of "an exclusive privilege and immunity" to the local humane society, because the law allowed the society's pound to hold dogs without taking out licenses on them. The court's ruling, however, recognized the complex nature of public-private relationships, in which, for example, the state granted public funds to private charities for the maintenance of orphanages, asylums for the deaf and blind, and correctional facilities for juvenile delinquents. The decision also acknowledged the mixed character of volunteer fire departments, which were neither wholly public nor wholly private, but whose century-long tradition of service reflected an acceptable delegation of the police power. Nonetheless, the court ruled that the grant of dog licensing authority to the Mohawk and Hudson River Humane Society lay outside acceptable legal boundaries.⁹⁹

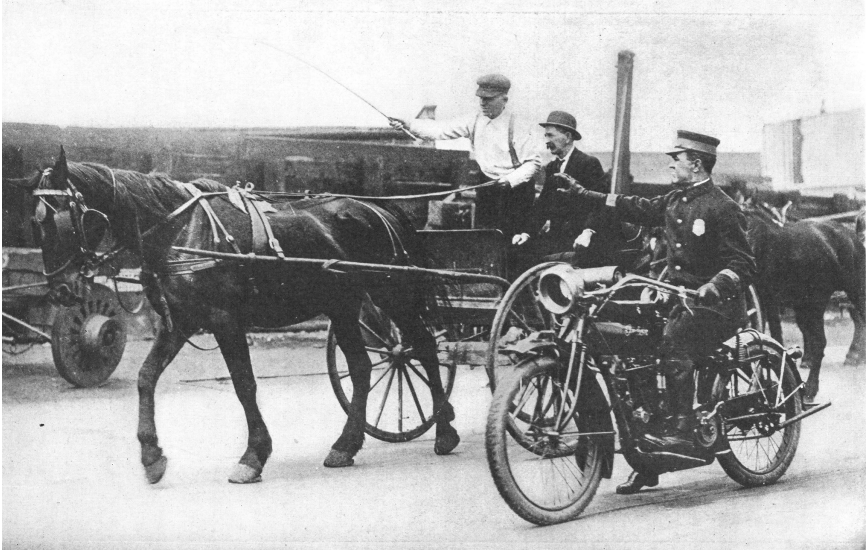
New York City's dog laws came under a separate statute, so *Fox* had no immediate ramifications for the ASPCA. Nonetheless, the case's worrisome precedent led the society to seek revisions from the state legislature to the city's shelter and licensing laws, as well as a detailed legal analysis from Charles Andrews, a former chief justice of the Court of Appeals. Andrews concluded that the ASPCA's authority could survive judicial scrutiny and that the specific legal issues that had doomed the state's general statute did not apply to the special charter under which the ASPCA operated. The society legitimately exercised the police power of the state, he reasoned, and although technically private in character, it was public in its purposes and in effect constituted "a subordinate public agency to perform a service which the Legislature might delegate to a citizen or public body."¹⁰⁰

These maneuvers took place just months before the Department of Health entered the 1903 debate over muzzling, and taken together, both developments indicated new pressures on the public authority of voluntary organizations. As noted earlier, state agriculture department veterinarian Gill also questioned whether private organizations ought to carry out public policy,

and in subsequent years, health officials continued to cast their arguments against the ASPCA in terms of the proper exercise of public authority. In early 1906, for example, when health commissioner Darlington backed a bill to transfer the ASPCA's dog-licensing power to the city health department, he labeled the ASPCA's licensing franchise a form of "graft" and declared "the collection of such fees by a private association . . . unconstitutional." Health officials increasingly believed that public agencies run by professional experts, rather than private organizations composed of well-meaning citizens, should possess authority over public health policy.¹⁰¹

Darlington's legislative gambit failed, but in 1908, just as the Department of Health was seeking a new round of rabies prevention measures, the ASPCA faced mounting legal attacks on its dog-licensing power from other sources. In January 1908, the ASPCA picked up Brian Boru, a well-bred Irish terrier owned by Bird S. Coler, Brooklyn's borough president. The ASPCA released the dog after Coler's son promised that his father would pay later, but Coler reneged out of skepticism about the dog-licensing law's constitutionality. Coler indignantly valued his dog at \$10,000 and argued that, according to legal precedents, the ASPCA had no right to take the animal and demand a \$3 payment for his return. Mayor McClellan weighed in with the past story of his own lost dog and declared, "Keelhaul this society and find out if it is legal for them to collect fees." Then in May, an ASPCA agent again encountered Brian Boru on the streets, still tagless, and sent him to the pound. Coler refused once more to pay the fine and licensing fee, and when the society threatened to euthanize Brian Boru if he were not reclaimed, Coler went to court for a temporary injunction that would preserve his dog's life while he challenged the constitutionality of the state's dog-licensing statutes.¹⁰²

At one level, the legal wrangling symbolized the old conflict between reformers and the political machine, but that struggle now took place in a context of changing municipal bureaucratic authority and new legal skepticism about delegation of the police power. Justice William J. Kelly of the Brooklyn Supreme Court heard the case in June, took it under advisement, and granted Coler his injunction in October. Kelly's opinion analyzed the question of the police power at length. Kelly first recognized the legitimacy of the state's police power, particularly with regard to matters of public health. "The act in question," he wrote, "is based on the police power of the state for the protection of the citizens from hydrophobia." Indeed, Kelly indicated that he had delayed issuing his decision for several months "in deference to the suggestion . . . that the continuation of the injunction would in some way interfere



The police power in action. An ASPCA agent pulls over a horse driver for violating anti-cruelty laws. *American Society for the Prevention of Cruelty to Animals Fifty-First Annual Report, Year Ended Dec. 31, 1916* (New York, 1917), 16.

with the work of [the] defendant in destroying mad dogs during the summer months, and because of the assertion that the inhabitants of the city of New York have no protection from mad dogs except through [the] defendant and its agents.”¹⁰³

Up to this point, Justice Kelly’s analysis provided a classic statement of nineteenth-century jurisprudence and its understanding of the police power’s broad application in the protection of the *salus populi*.¹⁰⁴ The justice then turned toward his reservations, however, especially his skepticism about the legitimacy of delegation of the police power to a private organization. He explained,

I do not believe that the Legislature can vest any such power as is sought to be conferred here in a private corporation. The agents who go into the streets of the city and seize these animals are not public officers. . . . It is a misdemeanor to interfere with these persons. They are described in the act as officers and agents of the society. They are vested with powers greater, in some respects, than public officers bound by oath and responsible to the public. I think the public health should be protected by the state or the municipality, acting through their duly designated representatives. . . . Great danger may result

from delegating to these private corporations duties which belong to the public and which should be performed by public officers. The Legislature may delegate duties to individuals which cannot be delegated to corporations. Without questioning the good that has been done in many cases by such associations, when it comes to interference with the person or property of the individual, I doubt whether the principle is right.¹⁰⁵

This passage powerfully illustrated the shifting conception in American law and politics at the turn of the century of the police power and the nature of public authority. First, Kelly's sense that the ASPCA's power to interfere "with the person or property of the individual" might invalidate the society's dog-licensing functions reflected a new emphasis on individual rights as a rationale for constraining the police power. Although post-*Lochner* jurisprudence promoted greater skepticism about the state's regulatory prerogatives in general, and not just the legal propriety of delegation, its formalistic reading of law had particularly threatening implications for the informal, ad hoc style of nineteenth-century arrangements that blended public and private authority. The delegation of the police power common in the nineteenth century now came under question before an increasingly vigorous discourse of individualism, especially regarding individual property rights. Second, in positing that responsibility for protection of public health rested with the state or city government, and that the government's "duly designated representatives" no longer included voluntary organizations such as the ASPCA, Kelly expressed an increasingly prevalent understanding that modern government properly operated through professional administration, and not as an expression of civic obligation or contribution.¹⁰⁶

While the ASPCA wrangled with Coler, the Department of Health attempted to take advantage of the situation. When the department sought an expanded appropriation for rabies prevention in January 1908, it cited, in what was apparently a mistaken reference to the *Fox* case, its belief that "the statute authorizing the collection of licenses by the American Society for the Prevention of Cruelty to Animals has been declared unconstitutional."¹⁰⁷ In early February, as Coler decried the ASPCA for its abuses of power, the Board of Health weighed in by arguing that the board was the appropriate governmental body for overseeing animal control.¹⁰⁸ Then in the fall, immediately after the Brooklyn court issued its injunction in *Coler*, Commissioner Darlington revived the idea of having his department take primary responsibility for animal control and using income from dog licensing, which would now

be paid directly to the city rather than the ASPCA, to employ the ASPCA under contract. As one measure of the seriousness of the legal threat to the ASPCA's authority, Alfred Wagstaff, the society's president, indicated he would consider Darlington's proposed subordination of the society to the Department of Health.¹⁰⁹

Instead, the ASPCA decided to seek clarification through the courts. Coler apparently dropped his case, but the society continued to face other legal challenges, with mixed outcomes. In the fall of 1910, a local magistrate in Queens applied Judge Kelly's precedent in ruling the ASPCA's power to issue dog licenses unconstitutional and declaring that his court would no longer authorize summonses or warrants for the society's use.¹¹⁰ The following summer, however, the New York Supreme Court found the ASPCA's dog-licensing function constitutional in *The People ex rel. Henry E. Westbay v. Delaney*. Although the court observed that the state legislature "has not the right to vest in private associations authority and power affecting the life, liberty and property of citizens, except in a few special instances," the legislature possessed an "undoubted right to employ private associations and individuals in a purely administrative capacity."¹¹¹ This emphasis on the limited circumstances in which the state could delegate the police power suggested a narrower range of action than that allowed under the nineteenth-century tradition of the well-regulated society, but the decision still recognized the ASPCA's legitimacy.

As a lower court ruling, however, *The People ex rel. Westbay* provided no definitive resolution. The acquisition of greater power over canine animal control by the Department of Health in 1914 occurred within this context of legal uncertainty for the ASPCA. Then in 1917, a new state law placed dog licensing under the authority of town and city clerks in smaller municipalities defined as second or third class.¹¹² The law did not apply to New York City, a first-class municipality, but it indicated a significant statewide decline in the policing prerogatives of animal welfare organizations.

Finally, in December 1920, the US Supreme Court's decision in *Nicchia v. People of the State of New York* settled the constitutional question in the ASPCA's favor for good. Mary Nicchia was charged in the fall of 1916 with violating New York City's dog-licensing statute. Although her guilt was affirmed at every stage of the process, Nicchia appealed all the way to the Supreme Court, which found the city's dog-licensing law "within the police power of a State." Although courts now subjected the police power to extra-close scrutiny under the Fourteenth Amendment and its restrictions on states'

power to deprive citizens of property and liberty, the New York statute passed muster. First, the court observed, "Property in dogs is of an imperfect or qualified nature," and therefore "they may be subjected to peculiar and drastic police regulations by the State without depriving their owners of any federal right." The common law tradition that considered dogs in an intermediate position between wild animals and useful domesticated animals opened dogs to more extensive regulation than other forms of property. The court then ruled that the reasonable delegation of the state's power to regulate dogs "to a corporation created by it for the express purpose of aiding in law enforcement" also posed "no infringement of any right guaranteed to the individual by the federal Constitution."¹¹³ As with the New York Supreme Court's 1911 decision in *The People ex rel. Westbay*, the US Supreme Court's ruling in *Nichia* suggested the reduced range of the state's police power as compared to nineteenth-century practice, but those limits still contained considerable scope for delegation of power to voluntary associations such as the ASPCA.



Traditional historical writing about politics and the American state, with its conventional focus on social welfare policy and economic regulation, has rendered dogcatching and other forms of everyday governance invisible or trivial in a grand narrative concerned with explaining the rise of administrative power and the emergence of a strong federal government. A recognition of "stateness" outside the Weberian model of centralized bureaucracy, however, produces a novel understanding of American political development. One must still acknowledge the profound changes that have occurred in the growth of bureaucratic authority and the emergence of federal power since the late nineteenth century, but it is also necessary to take seriously the persistence of localized forms of governance that embodied complex, messy arrangements between public and private. The surprisingly rich and convoluted political history of rabies prevention and canine animal control in New York City highlights precisely the blend of public and private authority that constitutes the essence of government in the United States.

In the case of the ASPCA, close judicial scrutiny of the police power and administrative agencies' new willingness to challenge voluntary organizations' authority created instability where none had existed before. Yet the society emerged from the litigation of the 1910s with its law enforcement functions intact. Although in subsequent decades the society continued to face periodic political attacks that it benefited from an inappropriate delegation of power by the state, it adapted creatively to shifting circumstances and

developed new kinds of arrangements with the institutions of city government.¹¹⁴ By the late 1970s, as the costs of animal control and maintenance of shelters outpaced dog-licensing revenue, the Department of Health even temporarily subsidized the ASPCA's operations, until City Hall stepped in with more permanent funding. In the 1980s, keeping up the ASPCA's animal control functions required the input of the municipal government, borough presidents, the state legislature, and private donors, in addition to the society's own commitments. Elaborate funding mechanisms, such as the joint action in 1989 by the ASPCA and the city government to organize a \$22.8 million bond issue to support the construction of new facilities, demonstrated the persistence of public-private collaboration in urban governance.¹¹⁵ When the ASPCA gave up dog licensing and animal control in 1995, it did so not because of objections to the wielding of public authority by private organizations, but because of chronic underfunding, combined with an attitudinal shift against the destruction of healthy strays.¹¹⁶ The ASPCA retained the authority to enforce the city's anti-cruelty laws, however, as do animal protection societies in countless other jurisdictions across the United States.

Moreover, the ASPCA's withdrawal from animal control did not overturn the private exercise of public authority in canine animal control, but instead produced yet another convoluted reconfiguration of the public-private mix. Rather than establish a government agency to run the city's animal shelters, a new nonprofit corporation, the Center for Animal Care and Control (CACC), took up the task under a municipal contract with the Department of Health and Mental Hygiene. The CACC's status differed from the ASPCA's, however, in that the new organization was less a private, voluntary organization than a public-private hybrid created by the state. Formed at the behest of Mayor Rudy Giuliani, the CACC had an initial governing structure that underscored the imbrication of the state within the legal framework of a nonprofit corporation. The seven-member governing board consisted of one representative each from the Department of Sanitation, the Police Department, and the Department of Health, with the four remaining members appointed by the mayor and serving at the mayor's pleasure.¹¹⁷ In 1998, Rosemary Joyce, a former board member who was pushed out following one of the CACC's frequent internal power struggles, commented acidly on the blurred institutional identity of the organization: "When it's convenient, they act like a city agency; when it's not, they act like a nonprofit. . . . The CACC is just part of the mayor's machine."¹¹⁸

Over more than two decades of operation, the CACC has racked up a long

record of mismanagement, including the organization's virtual shutdown during Hurricane Sandy in October 2012 and the ensuing disarray for city residents trying to deal with found and displaced animals. Three months later, Manhattan borough president Scott Stringer issued a lengthy report that indicted the center's general inability, from the very beginning, to maintain safe and sanitary conditions for shelter animals.¹¹⁹ It is not necessary to relate the ugly and heartrending details of the CACC's history of dysfunction, since my point here concerns not the workability of the hybrid public-private model, but its more basic existence as a legitimate form of governance with a well-established line of political descent.¹²⁰ Whether for better or for worse, the CACC underscores the wide range of possible mixtures of public and private that are strewn throughout the American political landscape, both past and present, and that defy a simple conceptual division between public and private.

The history of animal protection and control is far from exceptional in highlighting the place of delegated police power and other complex blends of public and private in the American political system. Informal arrangements and highly permeable boundaries between state and society form an integral part of how governance has functioned throughout the history of the United States. One need only consider the multitudinous organizations deemed "quasi-governmental" or "semi-municipal" to know that the ASPCA's history is far from exceptional.¹²¹ As Matthew Lassiter once commented, even the history of late twentieth-century "privatization" has to be understood not as the *opposite* of statism, but as another *form* of statism, given that law, public policy, and public authority undergird homeowners' associations, citizens' police organizations, and all manner of other supposedly private arrangements.¹²²

Christopher Capozzola has identified the particularly potent blend of voluntarism and state objectives that dominated American political culture during World War I and observed that "the lived experience of public and private, federal and local, rights and obligations was muddled—and up for grabs."¹²³ That unwieldy combination emerges as more the rule than the exception, once one recognizes that these concepts have always been muddled and contested, from the earliest days of the republic to the present. Elisabeth Clemens's notion of the "Rube Goldberg state" offers an apt metaphor for capturing the creative, improvised, and chaotic nature of American statecraft and the abundant varieties of practice that undermine neat and orderly theoretical concepts of the state and the public-private distinction.¹²⁴ Public and

private, like oil and water, actually *do* mix, in an emulsion that suspends their relationship in a constant state of negotiation and renegotiation. As much as contemporary American political rhetoric sees government as the antithesis of the private sector and imagines the two as functionally separate categories, public and private are not opposites—rather, they are mutually constitutive. Their intertwined relationship remains fundamental to the nature and structure of American governance to the present day.

Conclusion

The history of interrelationships between humans, dogs, and deadly zoonotic disease during an utterly transformative era of urban growth in New York City touches on myriad themes in the shared histories of the American city, medicine and public health, human-animal relations, politics and state power, and society and culture. Writing the history of a single disease is akin to writing a biography: the author follows her subject wherever it may lead, rather than starting with a particular set of questions with which to construct an argument-driven monograph. Infectious diseases virtually demand this kind of approach, since their histories encompass not just the biological relationships between disease agents and human bodies, but complex ecologies that entangle the natural and the social. This study has therefore followed rabies through a thicket of historical highways and byways, with its branching paths through city streets shared by humans and domestic animals, the cultural spaces of death and dying, and the interlaced passageways of therapeutics, medical authority, and democratic self-rule. From the mid-nineteenth to the early twentieth century, the disease made its presence known in New York City at multiple levels, from the most local of encounters between humans and dogs on stoops and sidewalks, to the transatlantic ties by which Pasteurian rabies vaccination and other forms of medical knowledge and practice reached the United States, to the global flows of knowledge, materials, and beliefs that supported a full panoply of ideas about disease transmission, human-animal ties, and therapeutic choices. Rabies also mattered as a vehicle for New York's medical vanguard to ponder and debate the anatomical basis of disease, and as a site for institutional developments that shaped the provision of rabies vaccination, as well as political contestations surrounding not just canine animal control, but the nature of governmental

power in the United States. Altogether, this rich array of connections illuminates the deep embeddedness in American society of a disease that was, and remains, both extremely rare and exceedingly notorious.¹

Rabies underscores the broad scope of medical endeavor in the nineteenth and early twentieth centuries, an era of exciting new advancements as well as commitments to long-held precepts. Change aplenty defined the world of American medicine during this era. New therapeutic options derived from the chemical laboratory and from the botanical possibilities of empire, novel techniques for examining bodily tissues in ever-greater detail through microscopy and cellular pathology, newfound confidence in neurological explanation, and the powerful combination of sanitarian activism and germ theory that fueled public health's growing prominence all played important roles in rabies' medical history in New York City. At the same time, however, commitments to pathological anatomy and lesion-based explanations of disease remained essential to physicians' conception of medical science, and even their own professional identities, throughout the time period in question. Rabies defied expectations, yet anatomical convictions stayed strong. Constitution-ism continued to inform everyday notions of health and its maintenance as well, even if it lost ground as an overarching theory. Indeed, our own, present-day notions about health and illness still reflect this older tradition. Contemporary explanations for the relationship between stress and illness, for example, although rooted in more recent ideas about body chemistry and the physiological mechanisms that translate stress into inflammatory processes and poor health, also owe something to constitutional assumptions about the virtues of equilibrium. One imagines that nineteenth-century physicians would have thought such findings provided scientific validation for their axiomatic assumptions and practices.

Throughout this book, I have strived to emulate what I like most about the history of medicine, namely, the field's ability to render comprehensible ways of thinking about disease and the human body that so often at first glance seem completely baffling and simply wrongheaded. A wild array of rabies remedies and preventatives, whether based on folk beliefs and popular healing traditions, competing medical sects' divergent practices, or the latest laboratory developments, derived their support from established theories about health and the body, and they spoke to problems of medical authority in a democratic society. Pasteurian rabies vaccination ultimately emerged as the single most important medical breakthrough for dealing with the disease, as well as a signal achievement in the history of medicine more generally. But

one must also appreciate the position of Pasteur's critics, whose skepticism made considerable sense from the standpoint of faith in anatomical explanations as the essence of scientific rigor. Without identifiable lesions and convincing physiological mechanisms by which an agent in a dangerous animal's saliva so thorough wrecked the body, the germ-based explanation for hydrophobia seemed, at best, profoundly incomplete. One need not reject the validity of Pasteur's work (and I certainly do not) in order to appreciate such points. Indeed, a century later, despite all manner of new findings in cellular and molecular biology, there is still no consensus about the neurological means (e.g., through direct destruction of neurons, inflammation of the brain, or disruption of neurotransmission) by which rabies virus exerts its horrifically deadly effects.² Furthermore, the path that preventive hydrophobia treatment took to establish itself in the United States also highlights the significance of political economy, and not just the latest ideas and techniques, to the transfer of medical practices from one locale to another. Here the nascent pharmaceutical industry provided the critical institutional form for Paul Gibier's successful "pasteurization" of New York City in the 1890s. The history of Pasteurian rabies vaccination's introduction to the United States underscores how scientific and medical possibility evolved through symbiotic relationships with social structures and institutions as part of the ecology of knowledge in turn-of-the-century America.³

Beyond the history of medicine, the social history of rabies and urban dogs attunes present-day observers to the historically contingent nature of much that goes unnoticed in everyday social and political life. Today's orderly urban world, largely free from "vagabond curs" and "tramp cats," not to mention horses and livestock, arose as a particular human creation that had only begun to come into existence in American cities during the early decades of the twentieth century. The current ethic of kindness and sentimentality toward companion animals grew out of an immense project of social engineering headed in large part by animal welfare advocates in the second half of the nineteenth century. There was nothing inevitable about Americans' love for their pets and the forms of affectionate indulgence that it now generally takes.⁴ Americans might have chosen to banish "useless" animals from the home and from city limits altogether, but they adopted them as beloved family members instead. A full history of animal fighting dens has yet to be written, but the nineteenth-century masculine, working-class realm of blood sports in New York City represented a subculture with an alternative sense of values and attitudes toward animals. In that social world, human admiration for

raw strength and grit defined the human-animal bond, in a relationship that melded love, violence, and masculine identity at a time of working-class enthusiasms that also embraced bare-knuckle fistfighting, along with the street brawls that accompanied nineteenth-century urban political life. The middle-class ethos of the sentimental family ultimately came to prevail in human relationships with cats and dogs, just as Victorian notions of order, refinement, and self-discipline eventually reined in the exuberantly rough excesses of New York street life in large portions of the city. The persistence of animal fighting as an underworld activity today in particular regions of the United States, however, including in certain pockets of urban America, suggests the continued strength of a harder-edged, more brutal approach to the human-animal relationship, as well as the rest of life's possibilities.⁵

Dogs and rabies have also been fodder for other major clashes over culture and politics, as part of the historical dynamic between disease, animals, and humans. Turn-of-the-century anxieties about civilization infiltrated the deepest recesses of social life, thought, and feeling, including ruminations over dogs and disease. Novel concerns about animal welfare stimulated support for hydropathy and fed opposition to Pasteur treatment. The institutional arrangements surrounding rabies vaccination and animal control also shed light on larger questions about the state and American political development. On the one hand, the ascendance of public health bureaucracies and the stature they attained within municipal governments speaks to the indisputable rise of the administrative state and its rapidly expanding capacities in the early twentieth century. But the ASPCA's century-long oversight over canine animal control also highlights voluntary organizations' persistent role in carrying out the work of governance in the United States. The blended public-private relationship remains a powerful force in American public policy to the current day, whether in the form of animal protection societies that continue to enforce anti-cruelty laws, churches and other local organizations that dispense public social welfare dollars under grants or contracts, privatized prisons that do the work of the American carceral state, or Halliburton and other corporate contractors that carry out US military functions in far reaches of the globe.

In the decades since the 1910s, much has changed about the management of urban animals in the United States with the advancement of ever-stronger expectations of order and control. Where New Yorkers once expected to see dogs loping about on their own, the obedient dog at heel or on leash under human supervision has become a social norm. Today, the typical American

city dog can scarcely evacuate its bowels before a human swoops down to remove the offending material. For filth-ridden New Yorkers who had barely begun to enjoy cleaner streets in the 1890s, such a scenario would have been unimaginable, but new laws in the 1970s, changing attitudes, and a plentitude of plastic bags has rendered the practice commonplace. The full-time indoor cat is another twentieth-century innovation, made possible not just by the moral exhortations of animal welfare societies, but also the discovery of kitty litter and its odor-absorbing properties, the development of spay-neuter as a standard veterinary practice, and the inculcation of surgical intervention into the values system of responsible pet ownership.⁶ Medicine, technology, the consumer economy, and culture blended together to create contemporary American pethood.

Vaccination, frequently required by law, has all but eliminated pet-borne rabies as a threat to human health in the United States. More than a year before Pasteur's famous October 1885 announcement, when a French commission backed Pasteur's recent findings that attenuated virus could be used to protect dogs from rabies, the *New York Herald* already imagined a future in which nations would enact laws "requiring owners of dogs to have their animals thus made safe."⁷ For several decades after Pasteur treatment became available, however, the expense of the procedure and the inconvenience of subjecting an animal to a long series of shots rendered it inaccessible for all but the wealthiest and most committed pet owners. The New York Pasteur Institute vaccinated dogs from time to time, such as the "prize bulldog" and two other "valuable dogs" who underwent Pasteur treatment at a cost of \$100 each in June 1908 after they suffered bites from suspicious strays. But rabies vaccination for pets did not gain in wider popularity until veterinarians launched major educational campaigns in the 1930s, and it became a general expectation of American pet stewardship only in the post-World War II period.⁸

In a contemporary era of rabies vaccination and animal control, New York City has not experienced a single human rabies death in more than half a century, and nationwide no more than one to three Americans in a typical year now die from the disease, contracted primarily through domestic bat bites or contact with infected dogs abroad, plus the occasional encounter with a rabid raccoon.⁹ Yet the urban world of animals continues to defy complete human control, and the threat from rabid animals remains a part of life in New York City. In the 1990s rabies became enzootic among raccoon populations in New York State, which has led to major outbreaks among urban

members of the species, most recently in 2010, when public health officials identified and destroyed more than a hundred infected raccoons in and around Central Park.¹⁰ More recently, coyotes have become an increasingly visible presence in New York City's human-wildlife interface. In April 2015, excited New Yorkers eagerly tweeted about a coyote sighted in Riverside Park who easily evaded the police and other pursuers, along with a second coyote captured days later in Lower Manhattan's Battery Park City, a busy waterfront residential development next to the Financial District. The two animals typified their species' easy adaptability to urban life, which encompasses a growing population in the five boroughs. Coyotes' appropriation of New York as native habitat, along with recent episodes of humans bitten by rabid coyotes in Westchester County and the New Jersey suburbs, also suggests that canine rabies will eventually make an occasional reappearance in New York City itself.¹¹

Meanwhile, in other parts of the world rabies remains very much a part of a fearful living present. According to the latest figures from the World Health Organization, dog bites or scratches account for as much as 99 percent of the estimated 55,000 human rabies deaths each year worldwide. Disease control initiatives have dramatically reduced mortality from rabies in Latin America and the Caribbean by more than 90 percent over the past three decades, a salutary development that, along with programs to expand vaccination of dogs and post-exposure vaccination of people in South and Southeast Asia, lends optimism to the joint effort of the World Health Organization and the World Organization for Animal Health to eliminate human rabies deaths entirely by the year 2030. For now, however, the Asian and African continents remain hard-hit, particularly in rural areas. India accounts for more than a third of cases with about 20,000 deaths a year, while China occupies a distant second place with some 2000 rabies deaths annually, but with hopes to eliminate human cases by 2025.¹² Meanwhile, in southern Africa, a canine scourge whose spread was facilitated by disease ecologies that accompanied imperial expansionism well over a century ago continues to plague societies and challenge post-colonial and post-*apartheid* governments still struggling to deal with multiple legacies of European colonialism, rabies included.¹³

The current global situation produces scenes and situations that nineteenth-century New Yorkers would have found distressingly familiar. The prevalence of rabies deaths among children, who account for about 40 percent of victims, offers one recurrent theme. Campaigns against strays provide another. Dog culls in China continue to be established strategy on the part of the state,

although a nascent animal protection movement sometimes stands in the way. In May 2009, for example, the local government in Heihe, China, in the northeastern province of Heilongjiang, had to scuttle plans for the mass extermination of the city's dogs after pet owners and animal welfare advocates protested. Days later, however, far to the west in Yangxian county, Shaanxi province, the government undertook without significant opposition a large-scale dog cull that included club-wielding officials who dispatched strays.¹⁴ More recently in India, the proliferation of stray dogs and rabies in Kerala as of 2016 had grown so treacherous, and state capacity so limited, that armed mobs or dogcatchers hired by private parties took to killing dogs in the streets, to the chagrin of local activists devoted to preventing the cruel treatment of animals.¹⁵

New Yorkers from the nineteenth-century world of loose dogs on city streets would have easily recognized their own lives in these circumstances. Americans today generally enjoy the luxury of freedom from fear of rabies, except as an exercise of imagination or a nagging motivation to keep pets' vaccinations up to date. The present is not as far removed from the past as one might like to think, however, and mad dogs continue to prompt real-life fears and nightmares in the twenty-first century.

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APPENDIX 1

*Reports of Dog Bite Victims and Hydrophobia Deaths
in the Greater New York City Area by Decade, 1860s, 1880s, and 1900s*

TABLE A.1.
*Dog bite victims and hydrophobia deaths, New York City and Brooklyn, by age and gender, with animals' status indicated,
as reported in the New York Times*

	Bite victims				Hydrophobia deaths			
	Adults		Children (16 and under)		Adults		Children (16 and under)	
	Male	Female	Male	Female	Male	Female	Male	Female
1860–1869	4 (2 known dogs, 2 unidentified)	1 (1 unidentified dog)	2 (2 unidentified dogs)	1 (1 unidentified dog)	4 (1 known dog, 2 unidentified, 1 victim w/o history of dog bite)	1 (1 unidentified dog)	1 (1 unidentified dog)	0
1880–1889	27 (4 known dogs, 23 unidentified)	1 (1 unidentified dog)	12 (1 known dog, 10 unidentified; 1 unidentified cat)	2 (1 known dog, 1 unidentified)	4 (1 known dog, 3 unidentified)	0	9 (8 unidentified dogs, 1 uniden- tified cat)	2 (1 known dog, 1 unidentified)
1900–1909	56 (17 known dogs, 2 known cats, 37 unidentified dogs)	17 (12 known dogs, 3 known cats, 2 uniden- tified dogs)	75 (23 known dogs, 1 known cat, 51 uniden- tified dogs)	21 (6 known dogs, 14 unidentified; 1 unidentified cat)	15 (7 known dogs, 1 known cat, 6 uniden- tified dogs; 1 victim w/o history of dog bite)	2 (2 known dogs)	11 (2 known dogs, 9 uniden- tified)	5 (5 unidentified dogs)
Total (all three time periods)	87	19	89	24	23	3	21	7

Note: Not included for the period 1900–1909: 3 adult victims, gender unknown (bitten by an unidentified dog); 5 children, gender unknown (bitten by an unidentified dog); 11 victims, age and gender unknown (6 bitten by an unidentified cat; 5 bitten by a family cat). In the table, animals with multiple victims are counted multiple times: that is, if the same unfamiliar dog bit five different people, it is listed as five unidentified dogs. In the table, cases in which the victim was reported to be dying or expected to die are recorded as rabies deaths.

TABLE A.2.
*Dog bite victims and hydrophobia deaths in the Greater New York City area, by age and gender, with animals' status indicated,
as reported in the New York Times*

	Bite victims				Hydrophobia deaths			
	Adults		Children (16 and under)		Adults		Children (16 and under)	
	Male	Female	Male	Female	Male	Female	Male	Female
1860–1869	7 (3 known dogs, 4 unidentified)	1 (1 unidentified dog)	3 (1 known dog, 2 unidentified)	2 (2 unidentified dogs)	8 (2 known dogs, 4 unidentified, 2 victims w/o history of dog bite)	1 (1 unidentified dog)	2 (1 known dog, 1 unidentified)	1 (1 unidentified dog)
1880–1889	28 (9 known dogs, 18 unidentified; 1 unidentified cat)	5 (2 known dogs; 3 uniden- tified)	23 (3 known dogs, 19 unidentified; 1 unidentified cat)	9 (4 known dogs, 3 unidentified; 2 unidentified cats)	11 (4 known dogs, 7 unidentified)	2 (1 known dog, 1 unidentified)	11 (1 known dog, 9 unidentified; 1 unidentified cat)	4 (2 known dogs, 2 uniden- tified)
1900–1909	84 (28 known dogs, 2 known horses, 2 known cats, 52 unidentified dogs)	31 (18 known dogs, 2 known cats, 11 uniden- tified dogs)	96 (30 known dogs, 1 known cat, 64 uniden- tified dogs, 1 un- identified cat)	30 (9 known dogs, 21 unidentified)	23 (10 known dogs, 1 known cat, 10 uniden- tified dogs, 2 victims w/o history of dog bite)	5 (4 known dogs, 1 uniden- tified)	18 (3 known dogs, 15 unidentified)	5 (5 known dogs)
Total (all three time periods)	119	37	122	41	42	8	31	10

Note: Not included for the period 1900–1909: >31 cases of bite victims for whom age and gender are unknown (one incident involving an unidentified dog who bit more than 20 people; 5 people bitten by a known dog and 6 people bitten by an unidentified cat on other occasions); 4 adults, gender unknown, bitten by unidentified dogs on two separate occasions; 18 children, gender unknown, 13 of them bitten by unidentified dogs on four separate occasions and 5 bitten by known dogs on two separate occasions. In the table, animals with multiple victims are counted multiple times: that is, if the same unfamiliar dog bit five different people, it is listed as five unidentified dogs. In the table, cases in which the victim was reported to be dying or expected to die are recorded as rabies deaths.

A Note on Primary Sources and Methods

Some readers may wonder why my account of the social history of rabies relies so heavily on newspapers and other published sources. Unfortunately, few archival materials remain to document the events and developments described in this book. Available primary materials for the New York City Department of Health include minutes and annual reports, but the agency's more detailed administrative records and the papers of key figures such as Hermann M. Biggs and William H. Park have not survived. A small collection of Anna Wessels Williams's papers, consisting mainly of an unpublished memoir, is the surviving exception and is housed at the Schlesinger Library at Harvard University's Radcliffe Institute for Advanced Study. No archival collections whatsoever exist for the American Pasteur Institute, the New York Pasteur Institute, or the physicians involved with them. The personal papers of William A. Hammond and the other elite New York physicians who wrote about and puzzled over rabies have vanished as well. Nor can one easily trace the behind-the-scenes workings of animal welfare advocacy in New York. Sadly, the American Society for the Prevention of Cruelty to Animals apparently disposed of its old records during a move in the 1950s, and whatever personal correspondence ASPCA founder Henry Bergh may have kept is long gone. Consequently, my analysis depends mainly on published documents rather than archival findings.

Fortunately, the increasingly lavish online research environment that has developed in recent years provides an alternative source base, and this book is very much a product of digital history and its possibilities. Keyword searches and digitized databases have granted newspaper-based research a level of scrutiny and power not possible in an earlier age of microfilm. Jon M. Harkness, for example, made a valiant effort to study the history of the American Pasteur Institute and the New York Pasteur Institute in the late 1980s, and he pieced together the best account possible in a predigital era, but the highly constrained source base allowed only preliminary findings.¹ By contrast, a generation later I possessed the technological means to draw rapidly from tens of thousands of newspaper issues. Rather than culling through newspapers for short, discrete stretches of time during identifiable rabies outbreaks, which would have been the research strategy for microfilmed sources,² I gathered every article that mentioned

either “hydrophobia” or “rabies” in four New York–area dailies—the *New York Herald*, the *New York Tribune*, the *New York Times*, and the *Brooklyn Daily Eagle*—over an eighty-year period, with spot checks related to specific topics in other newspapers via the Library of Congress’s “Chronicling America” database.³ When I started my research, I still had to travel to New York City or Boston to use physical copies of the *New York Journal of Medicine*, the *New York Medical Journal*, the *Medical Record*, and other nineteenth-century medical literature, but thanks to the HathiTrust, virtually every published English-language text that I sought is now easily accessible and searchable from my computer at home. Most of the medical journals cited in this study, along with the many treatises, pharmacopeias, dispensatories, and other guides to nineteenth-century materia medica that I consulted, came to me via the HathiTrust. In France, the Gallica database of the Bibliothèque Nationale de France provided access to pamphlets and documents that I otherwise would likely not have used, or even known about. These materials enriched my account immeasurably, particularly in chapters 3 and 5.

Digital bounty comes at a price, however, both literal and figurative. Many of the best, most usable newspaper databases remain proprietary and prohibitively expensive for all but the best-heeled academic institutions and thereby exacerbate institutional inequalities. Had it not been for a semester-long fellowship at Harvard University’s Warren Center for the Study of American History, along with the library access Harvard grants to faculty brats, I would have had a difficult time making more than limited use of the *Tribune* and the *Herald*.⁴ On the other hand, nonproprietary resources backed by generous public funding offer the potential to level the playing field to an unprecedented extent. The Brooklyn Public Library’s project to digitize the *Brooklyn Daily Eagle* and make it available to all through a high-quality, user-friendly system provides a model of enlightened devotion to public access. The HathiTrust’s hybrid structure of universal access, but special features exclusive to partners that cover expenses, has also made old and rare texts widely obtainable, albeit somewhat less usable for people without connections to partner institutions.

An age of digital plenty also requires intellectual caution. I remain conscious of the limitations of depending so heavily on a handful of newspapers with mass readerships, when New York possessed an unbelievably diverse news culture that included hundreds of ethnic papers by the end of the nineteenth century. Although the dailies earned wide readerships that cut across the political spectrum, they also represented the interests and outlooks of established white, male elites immersed in the lofty social circles and networks of business, high politics, and public affairs in New York City. The elite voices among the allopathic physicians who edited and wrote for medical journals and attentively nurtured the city’s medical societies and institutions similarly expressed the preoccupations of a particular segment of New York medical life. Of course, these communities at the top of the social hierarchy did not lack in diversity of thought and opinion, as any consideration of the partisan press of the nineteenth century or the intense and at times stormy intellectual and political disagreements among physicians quickly reveals. Nonetheless, this book might have turned out quite differently if I had

concentrated on uncovering attitudes toward dogs and disease in New York's ethnic neighborhoods, or on delineating Thomsonian physicians' perspectives on the etiology and treatment of rabies.

Reliance on newspapers and medical journalism has also shaped my analysis in other ways. Concerns with the history of the news and the paths by which ideas circulate appear as a leitmotif throughout the book, which is why my version of New York City has frequently moved outside of the city's borders, to encompass the virtual news space created by New York's vast print media. Given New York's transatlantic ties to Paris, its global status as a financial center second only to London by the mid-nineteenth century, its function as the United States' central hub in telegraphic communications, and the cosmopolitan engagements of its elites, it simply did not pay to police too strictly the city's formal boundaries. At the risk of anachronism, my discussion of rabies in New York City has also at times spilled over to include events in Brooklyn, even though the latter was a separate municipality until the consolidation of the five boroughs in 1898. I chose to do so because New York and Brooklyn were twin cities from early on, governed separately but intertwined by close economic ties and a transportation infrastructure that solidified their interdependence.⁵

Other choices shaped my narrative in small but significant respects. I have generally referred to dogs and other non-human animals in terms of "who" rather than "what," in order to emphasize their agency, presence, and also their intentions as creatures with distinct cognitive capacities, however inaccessible their thoughts and impulses may be to direct human analysis.⁶ In terms of nineteenth-century orthography and its vagaries, I made some arbitrary choices for the sake of consistency when, historically, there was none: for example, Charles P. Russel (vs. Russell) or Charles H. Shepard (a.k.a. Sheperd or Sheppard). In addition, out of sympathy for harried nineteenth-century newspaper editors and printers, I quietly corrected most of their obvious typesetting errors. For the sake of convenience, the word "Daily" was omitted from the titles of the *New York Tribune* and the *New York Times* in both newspapers' early years.

Finally, rather than labeling rabies remedies and other nineteenth-century medical ideas with tedious and repetitive qualifiers such as "supposed," "alleged," or "purported," I adopted the historian's practice of suspending disbelief and entering into the medical and cultural imagination of the time period. For the record, I am a historian and not a physician, and I do not endorse most of the therapeutics contained within these pages. To anyone who fears they have been exposed to rabies virus, please seek help immediately from a qualified medical professional and be prepared to undergo vaccination if necessary.

Introduction

1. "Dogs," *NYTr*, 10 June 1841, 2.
2. Neil Pemberton and Michael Worboys, *Mad Dogs and Englishmen: Rabies in Britain, 1830–2000* (Houndmills: Palgrave Macmillan, 2007), ix.
3. Pemberton and Worboys, *Mad Dogs and Englishmen*; Harriet Ritvo, *The Animal Estate: The English and Other Creatures in the Victorian Age* (Cambridge, MA: Harvard University Press, 1987), ch. 4; Kathleen Kete, *The Beast in the Boudoir: Petkeeping in Nineteenth-Century Paris* (Berkeley: University of California Press, 1994), ch. 6; Jean Théodoridès, *Histoire de la Rage: Cave Canem* (Paris: Masson, 1986); Karen Brown, *Mad Dogs and Meerkats: A History of Resurgent Rabies in Southern Africa* (Athens: Ohio University Press, 2011); Lance van Sittert, "Class and Canicide in Little Bess: The 1893 Port Elizabeth Rabies Epidemic," in *Canis Africanis: A Dog History of Southern Africa*, ed. Lance van Sittert and Sandra Swart (Leiden: Brill, 2008), 111–43; Eric T. Jennings, "Confronting Rabies and Its Treatments in Colonial Madagascar, 1899–1910," *Social History of Medicine* 22 (2009): 263–82; Philip M. Teigen, "Legislating Fear and the Public Health in Gilded Age Massachusetts," *Journal of the History of Medicine and Allied Sciences* 62 (April 2007): 141–70; Bert Hansen, "America's First Medical Breakthrough: How Popular Excitement about a French Rabies Cure in 1885 Raised Expectations for Medical Progress," *American Historical Review* 103 (April 1998): 373–418; John Douglas Blaisdell, "A Frightful—But Not Necessarily Fatal—Madness: Rabies in Eighteenth-Century England and English North America" (PhD diss., Iowa State University, 1995); Brett L. Walker, *The Lost Wolves of Japan* (Seattle: University of Washington Press, 2005), ch. 3. Bill Wasik and Monica Murphy's popular history, *Rabid: A Cultural History of the World's Most Diabolical Virus* (New York: Penguin Books, 2012), tends toward the episodic but contains useful information. The literature on Pasteur's development of rabies vaccination and the spread of Pasteur institutes worldwide is cited elsewhere in the present volume, especially in chapter 5.
4. As Karen Brown has pointed out in response to the limited research on the history of rabies, "The field is therefore wide open for more local studies as well as geographically larger projects that compare rabies ecologies across nations and continents." Brown, *Mad Dogs and Meerkats*, 172.
5. Ludwik Fleck, *Genesis and Development of a Scientific Fact*, trans. Fred Bradley

and Thaddeus J. Trenn (Chicago: University of Chicago Press, 1979; originally published as *Entstehung und Entwicklung einer wissenschaftlichen Tatsache* [Basel: Benno Schwabe and Company, 1935]); Andrew Cunningham, "Transforming Plague: The Laboratory and the Identity of Infectious Disease," in *The Laboratory Revolution in Medicine*, ed. Andrew Cunningham and Perry Williams (Cambridge: Cambridge University Press, 1992), 209–44. See also Susan D. Jones's account of the changing nomenclature and conceptual apparatus surrounding anthrax from the early modern period to the present in Jones, *Death in a Small Package: A Short History of Anthrax* (Baltimore: Johns Hopkins University Press, 2010), 15–24, and Michael Worboys's analysis of what it meant for a disease once known and understood as consumption or phthisis to become tuberculosis and then T.b., or *Tubercle bacillus*: Worboys, *Spreading Germs: Disease Theories and Medical Practice in Britain, 1865–1900* (Cambridge: Cambridge University Press, 2000), ch. 6. As Andrew Scull has noted, "disease entities are complex cultural productions. . . . The realm of disease is unstable . . . and doctors are generally no more able than their patients to shake themselves free of the assumptions and prejudices of their era." Scull, *Hysteria: The Biography* (Oxford: Oxford University Press, 2009), 11.

6. Recent studies have highlighted the centrality of disease ecologies and humans' environmental impacts to the spread of infectious disease. See, for example, Brown, *Mad Dogs and Meerkats*, and Randall M. Packard, *The Making of a Tropical Disease: A Short History of Malaria* (Baltimore: Johns Hopkins University Press, 2007). With respect to changes in bacterial genomes versus disease ecologies as sources of historical explanation, the example of plague neatly illustrates the challenges involved. The relative paucity of ultracontagious, bubo-ridden plague victims in the 1890s and 1900s later suggested to some historians that the new pandemic of the time period was either not the same disease as the Black Death of medieval lore or that the causal agent had become less virulent over time. Stigmatized populations, such as San Francisco's Chinese population in the early 1900s, also challenged the diagnosis of plague and discriminatory quarantine policies. Present-day genetic evidence, however, shows little change in *Yersinia pestis* itself and suggests that differences in disease ecology, such as the particular combination of vectors and hosts at work in transmission routes or variable susceptibility of human populations, may account for the dramatic etiological differences. Samuel K. Cohn Jr., "The Black Death: The End of a Paradigm," *American Historical Review* 107 (June 2002): 703–38, on 711–18; Nayan Shah, *Contagious Divides: Epidemics and Race in San Francisco's Chinatown* (Berkeley: University of California Press, 2001), ch. 5, esp. 132; Ewen Callaway, "The Black Death Decoded," *Nature* 478 (27 October 2011): 444–46; Kirsten I. Bos et al., "A Draft Genome of *Yersinia pestis* from Victims of the Black Death," *Nature* 478 (27 October 2011): 506–10; Kenneth L. Gage and Michael Y. Kosoy, "Natural History of Plague: Perspectives from More Than a Century of Research," *Annual Review of Entomology* 50 (2005): 505–28. I am grateful to David Patterson for alerting me to the literature on the genetics of plague and its historical implications.

7. Charles E. Rosenberg, "Introduction: Framing Disease: Illness, Society, and History," in *Framing Disease: Studies in Cultural History*, ed. Rosenberg and Janet Golden (New Brunswick, NJ: Rutgers University Press, 1992), xiii–xxvi, on xiii–xxvi, esp. xiv.

8. Anna Wessels Williams, unpublished autobiography, Chapter 16, p. 1, Box 1, Folder “Chapt. XVI 1896–1908+ Mad Dog,” Anna Wessels Williams papers, Arthur and Elizabeth Schlesinger Library, Radcliffe Institute for Advanced Study, Harvard University, Cambridge, MA; Wasik and Murphy, *Rabid*, 132.

9. On this point, see Pemberton and Worboys, *Mad Dogs and Englishmen*, 2, 195–96.

10. For a few examples, see “A Mad Horse—An Interesting Case of Hydrophobia,” *NYT*, 29 July 1865, 2; “A Horse with the Hydrophobia,” *NYT*, 13 June 1869, 3; “General,” *NYT*, 20 June 1871, 4; and “Hydrophobia in Brooklyn,” *NYT*, 28 June 1873, 12. Other similar usages will continue to appear throughout this book.

11. For example, see Charles P. Russel, “Hydrophobia in Dogs and Other Animals, and the Sanitary Precautions against Its Transmission to the Human Race,” in New York City Department of Health, *Fifth and Sixth Annual Reports of the Board of Health of the Health Department of the City of New York, May 1, 1874, to December 31, 1875* (New York: Martin B. Brown, Printer and Stationer, 1876), 716–63, on 735.

12. For example, physician Valentine Mott, who, in partnership with his father, made the first attempt to introduce Pasteurian rabies vaccination to the United States, also stood among the physicians who began to insist upon rabies as the sole descriptor for the disease. Mott, *Rabies and How to Prevent It: A Paper Read before the American Social Science Association, Saratoga, 8 September 1886* (Boston: Geo. E. Crosby and Company, 1887), 3–4. References to hydrophobia gradually waned from the tail end of the nineteenth century onward, but the term remained in use for decades. Keyword searches on databases for New York daily newspapers and area medical journals suggest a shift toward “rabies” as the preferred term already by 1900, and the diminishment of “hydrophobia” to minimal usage by the 1920s. The annual reports for the New York City Department of Health are also instructive. In 1906, the health department still kept statistics on human hydrophobia deaths, but by 1914 the department not only used “rabies” to refer to human cases, but also placed animals and humans in the same table on “Rabies Diagnosis for 1914.” *Annual Report of the Board of Health of the Department of Health of the City of New York for the Year Ending December 31, 1906*, vol. II (New York: Martin B. Brown Company, Printers and Stationers, 1907), 1098–1100, and *Annual Report of the Department of Health of the City of New York for the Calendar Year 1914* (New York, 1915), 61. Additional reflections on the distinction between rabies and hydrophobia, and its blurred boundaries, appear in chapter 2, note 15 of the present volume.

13. On this issue, I differ somewhat from Pemberton and Worboys, who emphasize the status of spurious hydrophobia as a recognized disease condition in British medicine already in the 1830s. See *Mad Dogs and Englishmen*, 2, 61, 69, 95, and 195–96. Although medical writers on both sides of the Atlantic acknowledged the existence of false cases, I find that authors in the middle decades of the nineteenth century were more interested in demonstrating the reality of hydrophobia as a distinct disease condition in its own right, not to be confused with, say, tetanus or epilepsy, or dismissed as the product of an overactive imagination. See, for example, J. L. Bardsley, “Hydrophobia,” in *The Cyclopaedia of Practical Medicine*, ed. John Forbes, Alexander Tweedie, and John Conolly, vol. II (London, 1833), 483–518, on 483–84; J. Lewis Smith, “Report of a Case of Hydrophobia; with Statistical Observations,” *NYJM* 15 (new series) (September

1855): 233–45, on 241; and Thomas H. Gage, *A Case of Hydrophobia: With Remarks* (Worcester, MA: Worcester District Medical Society, [1865]), read before the Worcester District Medical Society, January 1865, pp. 16–17, 20, copy in the New York Academy of Medicine Library, New York, NY. In a similar vein, William A. Hammond, in his 1871 treatise on diseases of the nervous system, acknowledged the existence of a hysterical form of hydrophobia but did not dwell on the phenomenon. Hammond, *A Treatise on Diseases of the Nervous System* (New York: D. Appleton and Company, 1871), 553–54. By contrast, amid concerns about the toll of modern urban life in the form of growing rates of neurasthenia and other forms of nervous disease, neurologists helped to elevate attention to pseudo-hydrophobia in the 1880s and 1890s. See, for example, E. C. Spitzka, “How Can We Prevent False Hydrophobia?” *Journal of Comparative Medicine and Surgery* 7 (July 1886): 244–67; William A. Hammond, “False Hydrophobia,” *North American Review* 151 (August 1890): 167–72; and Charles K. Mills and Charles J. Hoban, “Remarks on Two Cases Simulating Hydrophobia and Occurring after Dog-Bites,” *Journal of Nervous and Mental Disease* 15 (December 1890): 848–54. No-nonsense acceptance of pseudo-hydrophobia as a documented phenomenon that required diagnostic care to avoid confusion with genuine hydrophobia subsequently appeared in medical reference books: for example, William Osler, “Hydrophobia (Lyssa—Rabies),” in *A Text-Book on Nervous Diseases by American Authors*, ed. Francis X. Dercum (Philadelphia: Lea Brothers & Co., 1895), 215–19, on 217–18, and Charles Harrison Frazier, “Hydrophobia,” in *Surgery: Its Principles and Practice*, ed. William Williams Keen, vol. I (Philadelphia: W. B. Saunders Company, 1906), 530–36, on 534.

14. George Fleming, *Rabies and Hydrophobia: Their History, Nature, Causes, Symptoms, and Prevention* (London: Chapman and Hall, 1872), 7–18; Russel, “Hydrophobia in Dogs and Other Animals,” 718–20; Horatio R. Bigelow, *Hydrophobia* (Philadelphia: D. G. Brinton, 1881), 14–17. Fleming quickly became a standard source for American physicians interested in rabies, and the similar historical outlines in both Russel’s and Bigelow’s accounts reflected liberal borrowings from Fleming’s treatise.

15. On symptomatology, see Lewis Feuchtwanger, *Mad Dogs: Or Hydrophobia, with all Its Various Symptoms, Causes, and Remedies, Minutely Described* (New York: Wm. Applegate, 1840), 7–10; J. Lewis Smith, *Report of a Case of Hydrophobia; with Statistical Observations* (New York: Holman and Gray, 1856), 16–24; Fleming, *Rabies and Hydrophobia*, 188–281; Russel, “Hydrophobia in Dogs and Other Animals,” 740–52; H. Bouley, *Hydrophobia: Means of Avoiding Its Perils and Preventing Its Spread*, trans. A. Liautard (New York: Harper and Brothers, 1874), 9–32; and Bigelow, *Hydrophobia*, ch. 5. References to temperature and urine chemistry appear in Russel, “Hydrophobia in Dogs and Other Animals,” 752, and Bigelow, *Hydrophobia*, 81–82. For the impact of statistical analysis from the mid-nineteenth century onward, in addition to the aforementioned treatises by Smith, Fleming, Russel, Bouley, and Bigelow, consult Thomas W. Blatchford, *Hydrophobia: Its Origin and Development, as Influenced by Climate, Season, and Other Circumstances. Being the Report of the Special Committee Appointed by the American Medical Association, and Read at the Meeting in Detroit, MI, May, 1856* (Philadelphia: T. K. and P. G. Collins, 1856).

16. For an introduction to the recent scholarship in this area, the Biographies of Disease series published by Johns Hopkins University Press provides a convenient starting point. It is still difficult, however, to find a better programmatic statement

about disease and its diverse manifestations in human society than Charles Rosenberg's opening essay in the 1992 volume *Framing Disease*.

17. Thomas Bender, *New York Intellect: A History of Intellectual Life in New York City, from 1750 to the Beginnings of Our Own Time* (New York: Alfred A. Knopf, 1987), ch. 1; Menahem Blondheim, *News over the Wires: The Telegraph and the Flow of Public Information in America, 1844–1897* (Cambridge, MA: Harvard University Press, 1994); Michael Emery, "Newspapers," in *The Encyclopedia of New York City*, ed. Kenneth T. Jackson (New Haven, CT: Yale University Press and New York: New-York Historical Society, 1995), 809–21; Frank Luther Mott, *American Journalism: A History of Newspapers in the United States through 260 Years: 1690 to 1950* (New York: Macmillan, 1950), chs. 13–15.

18. John H. Griscom, *The Sanitary Condition of the Laboring Population of New York. With Suggestions for Its Improvement* (New York: Harper and Brothers, 1845); Charles E. Rosenberg and Carroll S. Rosenberg, "Pietism and the Origins of the American Public Health Movement: A Note on John H. Griscom and Robert M. Hartley," *Journal of the History of Medicine and Allied Sciences* 23 (January 1968): 16–35; John Duffy, *A History of Public Health in New York City, 1866–1966* (New York: Russell Sage Foundation, 1974), intro., chs. 1–11.

Chapter 1 • Dogs, Humans, and the Uses of Urban Space

1. Edward K. Spann, *The New Metropolis: New York City, 1840–1857* (New York: Columbia University Press, 1981); Steve Fraser, *Every Man a Speculator: A History of Wall Street in American Life* (New York: HarperCollins, 2005), ch. 3. The phrase the "Great Metropolis" is quoted in Spann, *The New Metropolis*, 1.

2. Spann, *The New Metropolis*, 183–88; Kenneth T. Jackson, *Crabgrass Frontier: The Suburbanization of the United States* (Oxford: Oxford University Press, 1985), 28–33. On the general significance of the economic relationship between city and hinterland, see William Cronon, *Nature's Metropolis: Chicago and the Great West* (New York: W. W. Norton, 1991). New York's hinterland reached out as far as Connecticut, with factories in Bridgeport and Danbury owned by New Yorkers. Richard B. Stott, *Workers in the Metropolis: Class, Ethnicity, and Youth in Antebellum New York City* (Ithaca, NY: Cornell University Press, 1990), 30. By contrast, suburbanization and economic integration with the city proceeded more slowly in Westchester County and the eastward expanses of Long Island due to slow, infrequent, and expensive rail service. Spann, *The New Metropolis*, 188–91; Jackson, *Crabgrass Frontier*, 94–95.

3. Eric Homberger, *The Historical Atlas of New York City*, rev. and updated ed. (New York: Henry Holt and Company, 2005), 76–77, 106–7; "City Railroads," *NYT*, 13 February 1854, 4; "Our City Railroads," *NYT*, 26 December 1865, 8.

4. Richard R. John, *Spreading the News: The American Postal System from Franklin to Morse* (Cambridge, MA: Harvard University Press, 1995), ch. 1; Menahem Blondheim, *News over the Wires: The Telegraph and the Flow of Public Information in America, 1844–1897* (Cambridge, MA: Harvard University Press, 1994), chs. 1–3.

5. Elizabeth Blackmar, *Manhattan for Rent, 1785–1850* (Ithaca, NY: Cornell University Press, 1989), ch. 3; Stott, *Workers in the Metropolis*, ch. 7; Edwin G. Burrows and Mike Wallace, *Gotham: A History of New York to 1898* (Oxford: Oxford University Press, 1999), 715–17; Fraser, *Every Man a Speculator*, 78–79.

6. Stott, *Workers in the Metropolis*, 9–20; Sven Beckert, *The Monied Metropolis: New York City and the Consolidation of the American Bourgeoisie, 1850–1896* (Cambridge: Cambridge University Press, 1993), 55–56, 155–56; Spann, *The New Metropolis*, 111, 212.

7. Spann, *The New Metropolis*, 24–27; Stott, *Workers in the Metropolis*, 72.

8. Amy Bridges, *A City in the Republic: Antebellum New York and the Origins of Machine Politics* (Cambridge: Cambridge University Press, 1984), quotation on 16.

9. Stott, *Workers in the Metropolis*, 203–5; Marion R. Casey, “Irish,” in *The Encyclopedia of New York City*, ed. Kenneth T. Jackson (New Haven, CT: Yale University Press and New York: New-York Historical Society, 1995), 598–602; Eric Homberger, *Scenes from the Life of a City: Corruption and Conscience in Old New York* (New Haven, CT: Yale University Press, 1994), 12–14, 30–37.

10. Christine Stansell, *City of Women: Sex and Class in New York, 1789–1860* (Urbana: University of Illinois Press, 1987; originally published 1986), 89.

11. Stott, *Workers in the Metropolis*, 201–4, 230–43, 247–64; Stansell, *City of Women*, 89–94; Bridges, *A City in the Republic*; Roger Daniels, *Coming to America: A History of Immigration and Ethnicity in American Life* (New York: HarperPerennial, 1991, originally published HarperCollins, 1990), ch. 6.

12. Roy Lubove, *The Progressives and the Slums: Tenement House Reform in New York City, 1890–1917* (Westport, CT: Greenwood Press, 1962), 94, discusses New York City’s population density in the 1890s. Spann, *The New Metropolis*; Homberger, *The Historical Atlas of New York City*, chs. 5 and 6; and Burrows and Wallace, *Gotham*, part IV, cover the nineteenth-century transformation of New York City’s built environment. For an introduction to New York’s machine politics, see Bridges, *A City in the Republic*, chs. 2, 5, 7, and 8, and Steven P. Erie, *Rainbow’s End: Irish-Americans and the Dilemmas of Urban Machine Politics, 1840–1985* (Berkeley: University of California Press, 1990), chs. 1–3. On the bureaucratization of policing and sanitation, see James F. Richardson, *The New York Police: Colonial Times to 1901* (New York: Oxford University Press, 1970), chs. 2–3; John Duffy, *A History of Public Health in New York City, 1866–1966* (New York: Russell Sage Foundation, 1974), ch. 1; and Martin V. Melosi, *Garbage in the Cities: Refuse, Reform, and the Environment*, rev. ed. (Pittsburgh, PA: University of Pittsburgh Press, 2005), chs. 1–2.

13. On immigration, the transformation of work, and ethnic politics in New York City, see Bridges, *A City in the Republic*, esp. chs. 2, 6, and 8, and Erie, *Rainbow’s End*, ch. 1. For an introduction to urban progressivism, consult Michael McGerr, *A Fierce Discontent: The Rise and Fall of the Progressive Movement in America* (New York: Oxford University Press, 2003), ch. 2, and Jane Addams, *Twenty Years at Hull House* (New York: Signet Classics, 1961; originally published 1910).

14. Jacob A. Riis, *How the Other Half Lives: Studies among the Tenements of New York* (New York: Charles Scribner’s Sons, 1890); John H. Griscom, *The Sanitary Condition of the Laboring Population of New York. With Suggestions for Its Improvement* (New York: Harper and Brothers, 1845), 7–8, quotation on 5; Blackmar, *Manhattan for Rent*, ch. 6 (on the tight housing market of the 1840s and 1850s); Lubove, *The Progressives and the Slums*, ch. 2 (on the poor condition of tenement housing in the last third of the nineteenth century).

15. Daniels, *Coming to America*, ch. 6, esp. 121, 125–26, and 183–84, and ch. 10; John Higham, *Strangers in the Land: Patterns of American Nativism, 1860–1925* (New Bruns-

wick, NJ: Rutgers University Press, 1988; originally published 1955), ch. 4; Paul Boyer, *Urban Masses and Moral Order in America, 1820–1920* (Cambridge, MA: Harvard University Press, 1978), esp. chs. 2, 5, and 7; McGerr, *A Fierce Discontent*, 3–19; Michael B. Katz, *In the Shadow of the Poorhouse* (New York: Basic Books, 1986), 3–10; Clara J. Hemphill and Raymond A. Mohl, “Poverty,” in *The Encyclopedia of New York City*, 932–34. Although Herbert Asbury’s 1928 classic, *The Gangs of New York*, undoubtedly exaggerated in its depiction of New York’s past as an undifferentiated history of vice, crime, corruption, and violence from the 1830s to the 1910s, his account captured the long-term anxieties about squalor and iniquity that went hand in hand with the process of urbanization itself. Herbert Asbury, *The Gangs of New York* (New York: Vintage Books, 2008; originally published New York: Alfred A. Knopf, 1928).

16. Suellen Hoy, *Chasing Dirt: The American Pursuit of Cleanliness* (New York: Oxford University Press, 1995), chs. 1 and 2; Duffy, *A History of Public Health in New York City*, 34, 61, and 113; David Rosner, “Introduction: ‘Hives of Sickness and Vice,’” in *Hives of Sickness: Public Health and Epidemics in New York City*, ed. David Rosner (New Brunswick, NJ: Rutgers University Press, 1995), 1–21, on 6–7, 14; Sandra Opdycke, “Sewers,” in *The Encyclopedia of New York City*, 1062; Eric A. Goldstein and Mark A. Izeman, “Water,” in *The Encyclopedia of New York City*, 1244–46; Gretchen A. Condran, “Changing Patterns of Epidemic Disease in New York City,” in *Hives of Sickness*, 27–41, on 29, 33, 36; Elizabeth Fee and Evelyn M. Hammonds, “Science, Politics, and the Art of Persuasion: Promoting the New Scientific Medicine in New York City,” in *Hives of Sickness*, 155–96, esp. 156–62. “Board of Health,” *NYH*, 22 August 1872, 11, with its report of nearly 1,900 sanitary inspections carried out, suggests the seriousness of the Department of Health’s efforts in the early postbellum period. Upon his retirement from the NYCDH at the end of 1913, Hermann Biggs, the longtime booster of the health department’s capacities to deploy the power of the bacteriological laboratory for the promotion of public health, credited the decline in the city’s mortality rate from twenty-six per thousand in 1888 to less than fourteen per thousand in 1913 largely to the efforts of the department. Fee and Hammonds, “Science, Politics, and the Art of Persuasion,” 183.

17. Susan D. Jones, *Valuing Animals: Veterinarians and Their Patients in Modern America* (Baltimore: Johns Hopkins University Press, 2003), 17–18 (quotation on 17), 23, 42; Scott Anthony Miltenberger, “Promiscuously Mixed Together: New Yorkers and Domestic Animals in the Nineteenth-Century Anthrozootic City,” PhD diss., University of California, Davis, 2006, ch. 1 (for additional information on domesticated animals and urban life); James J. Flink, *The Car Culture* (Cambridge, MA: MIT Press, 1975), 34 (on horses and filth in city streets); and Roy Rosenzweig and Elizabeth Blackmar, *The Park and the People: A History of Central Park* (Ithaca, NY: Cornell University Press, 1992), 63, 70, and 73 (for additional evidence of livestock animals’ urban presence). As late as the 1920s, although car ownership had become widespread, horses still persisted in particular urban niches, such as at firehouses, where the costs of switching over to motorized transportation stayed too high. Clay McShane and Joel A. Tarr, *The Horse in the City: Living Machines in the Nineteenth Century* (Baltimore: Johns Hopkins University Press, 2007), 175–76.

18. Catherine McNeur, “The ‘Swinish Multitude’: Controversies over Hogs in Antebellum New York City,” *Journal of Urban History* 37 (September 2011): 639–60.

On animals, immigration, and middle-class urban anxiety up to the 1860s, see also Miltenberger, "Promiscuously Mixed Together," ch. 2.

19. *Fifth and Sixth Annual Reports of the Board of Health of the Health Department of New York City, May 1, 1874 to December 31, 1875* (New York: Martin B. Brown, 1876), 192–93.

20. As another inspector observed with disapprobation in 1870, "Dogs, hogs, goats, geese, and human beings are packed together in these dens." One of his colleagues, who walked the beat in the Seventh Sanitary Inspection District, also reported with dismay that in an area dominated by hundreds of ramshackle structures, "the keeping of pigs and cows in miserable sheds attached to the shanties is another source of unhealthiness." He added, "Our shanty population regard with special affection both these domestic animals, and the pig, above all, is the pet of the family." *First Annual Report of the Board of Health of the Health Department of the City of New York, April 11, 1870, to April 10, 1871* (New York: The New York Printing Company, 1871), quotations on 127 and 102, respectively.

Not all sanitary inspectors were so contemptuous toward the poor, however. Some inspectors sympathized with the inhabitants of the infamous Gotham Court and other areas mired in the worst forms of urban poverty. They praised residents' quickness to follow sanitary regulations, even if the city's most downtrodden populations often failed to keep pigs and cows at a healthful distance when left to their own devices. Such inspectors also blamed substandard housing and sanitary infrastructure for the horrific conditions that they found. In the Board of Health's first annual report, for example, health inspector Henry R. Stiles noted the following about his district, which encompassed the Fourth and Sixth Wards, as well as part of the Second Ward: "Put a family into a space of 10 x 10 feet, in a back room at the top of a five-story rear tenement-house, and the problems of domestic life, considered with relation to health and comfort, become infinitely more perplexing, both to them and to the public guardians of their health, than they ever could become if the same family occupied a house by themselves with plenty of air, light, and room." For Stiles, environment, not racial character, explained the plight of residents in the city's poor and predominantly immigrant neighborhoods. *First Annual Report of the Board of Health*, 102–10, quotation on 105.

21. The illustration, from the 7 September 1889 issue of *Frank Leslie's Illustrated Newspaper*, is reproduced in Rosenzweig and Blackmar, *The Park and the People*, 293.

22. "The Dog Laws," *NYH*, 29 April 1877, 10.

23. "Reforms and the Pound," *NYT*, 30 June 1854, 4; McNeur, "The 'Swinish Multitude,'" 642, 647–48. As late as the 1930s, more than half of American cities used pigs to dispose of food waste, although the pigs no longer ran loose. Heather Rogers, *Gone Tomorrow: The Hidden Life of Garbage* (New York: The New Press, 2005), 83–84. I thank Eagle Glassheim for directing me to Rogers's work.

24. Duffy, *A History of Public Health in New York City*, 21, 33; Jones, *Valuing Animals*, 19. See also Hendrik Hartog's delightful classic of legal history, "Pigs and Positivism," *Wisconsin Law Review* (1985): 899–935.

25. Jones, *Valuing Animals*, 21.

26. "Capture of Twenty-Eight Goats," *NYH*, 12 June 1874, 10. The Board of Health observed in its annual report for 1913 that in addition to the nearly four hundred per-

mits it issued for goat-keeping, other goats “roam at large because their owners are unknown and there are no public pounds to which they could be taken and held for ransom.” *Annual Report of the Department of Health of the City of New York for the Calendar Year 1913* (New York, 1914), 23.

27. “Dr. Goldwater to Remain: Mayor Praises Him and Indorses Dog Muzzling Ordinances,” *NYT*, 29 September 1914, 9; *Annual Report of the Department of Health of the City of New York for the Calendar Year 1914* (New York, 1915), 35.

28. *Ordinances of the Mayor, Aldermen and Commonalty of the City of New York. Revised A. D. 1859, by D. T. Valentine. Adopted by the Common Council, and Published by Their Authority* (New York: Chas. W. Baker, 1859). The quotation is from 428. The long lists of nineteenth-century regulations that appear in this section are intended as an homage to Bill Novak’s work. William J. Novak, *The People’s Welfare: Law and Regulation in Nineteenth-Century America* (Chapel Hill: University of North Carolina Press, 1996).

29. *Manual of the Board of Health, of the Health Department of the City of New York, 1874* (New York: D. Appleton and Company, 1874).

30. For some typical discussions, see, for example, the Minutes of the Board of Health for 16 October 1872, 23 October 1872, 28 April 1874, 24 January 1876, 1 February 1876, 23 February 1875, 7 March 1876, and 16 May 1876, in Microfilm, Minutes of Board of Health, Roll 5, “Board of Health Minutes 1871/1872–1877, 1879–1882,” Municipal Archives, New York, NY.

31. “Wild Steer at Large in the Streets,” *NYTr*, 3 November 1882, 8. On children’s lives out on the street, see Christine Stansell, “Women, Children, and the Uses of the Street: Class and Gender Conflict in New York City, 1850–1860,” *Feminist Studies* 8 (Summer 1982): 309–35. Despite efforts to mandate compulsory education or take other measures to keep children off the streets, the situation hardly changed over the rest of the nineteenth century. On the narrow profit margins in the beef industry, see Cronon, *Nature’s Metropolis*, 251.

32. “Dogs and Cats,” *NYT*, 15 March 1877, 4. Cats also sometimes fomented upheaval when they wandered into strange homes through open windows: “Bitten and Scratched by a Ferocious Cat,” *NYH*, 17 June 1891, 11.

33. “City Intelligence,” *NYH*, 25 May 1848, 2.

34. “The Nocturnal Dog Pestilence,” *NYH*, 27 July 1874, 9. For some telling accounts from Brooklyn, see “War on the Dogs,” *BDE*, 26 June 1857, 2; “The Dog Nuisance,” *BDE*, 30 June 1868, 3; and “The Dog Nuisance,” *BDE*, 22 June 1870, 4. For those who have noticed the anachronism of my seeming inclusion of Brooklyn in discussions of New York City prior to 1898, consult the explanation in appendix 2.

35. Letter to the Editor from “A Father,” “The Muzzling of Dogs,” *NYTr*, 18 September 1914, 6.

36. “The Slaughter of the Dogs,” *BDE*, 29 April 1877, 4; “The Merry Hydrophobia and the Cur,” *BDE*, 14 July 1879, 2; “Half a Million Dogs,” *NYH*, 27 December 1885, 5; “Luxuries for the Dogs,” *NYS*, 16 July 1899, 3; “The Fight against Hydrophobia,” *BDE*, 19 July 1908, “News Special” section, 1. In 1908, New York’s human population was perhaps a third larger than what it had been in 1899, and one therefore doubts that the number of owned dogs more than doubled in the same period.

37. Letter to the Editor from James T. Merchant, “The Public Health,” *NYH*, 31 August 1856, 8; “The City’s Canine Curse,” *NYH*, 19 August 1873, 8.

38. Katherine C. Grier, *Pets in America: A History* (Orlando, FL: Harcourt, 2006; originally published with different pagination by University of North Carolina Press, 2006), 15. Anecdotal evidence from early twentieth-century newspapers, such as the tale of a dog smuggled by steerage passengers, dog-hoarding by people living in a cramped shanty, or a boy bitten by a pet dog in a multifamily dwelling, testify to dog ownership in poor and working-class households. “Irish Fauna,” *NYS*, 1 August 1908, 5; “27 Dogs in a Tiny House,” *BDE*, 1 May 1908, 13; “Boy Bitten by Bulldog,” *New York Evening World*, Baseball and Racing ed., 20 August 1908, 6.

39. Grier, *Pets in America*, 97–100, 107–8.

40. See, for example, [untitled], *BDE*, 19 May 1878, 2, and “Home News,” *NYTr*, 28 September 1881, 8.

41. “Bitten Children to Sail To-morrow,” *NYTr*, 8 December 1885, 5.

42. On class-based anxieties surrounding dogs and rabies in settings beyond New York, consult Neil Pemberton and Michael Worboys, *Mad Dogs and Englishmen: Rabies in Britain, 1830–2000* (Houndmills: Palgrave Macmillan, 2007), 26–33, 37, 74–75; Harriet Ritvo, *The Animal Estate: The English and Other Creatures in the Victorian Age* (Cambridge, MA: Harvard University Press, 1987), 176–79, 185, 188–89, 196; Kathleen Kete, *The Beast in the Boudoir: Petkeeping in Nineteenth-Century Paris* (Berkeley: University of California Press, 1994), ch. 6; and Lance van Sittert, “Class and Canicide in Little Bess: The 1893 Port Elizabeth Rabies Epidemic,” in *Canis Africanis: A Dog History of Southern Africa*, ed. Lance van Sittert and Sandra Swart (Leiden: Brill, 2008), 111–43, esp. 141–43.

On New York’s underworld and fears about urban crime, vice, and violence from the 1840s onward, see, for example, Asbury, *The Gangs of New York*; Daniel Stashower, *The Beautiful Cigar Girl: Mary Rogers, Edgar Allan Poe, and the Invention of Murder* (New York: Berkeley Books, 2006); Timothy Gilfoyle, *A Pickpocket’s Tale: The Underworld of Nineteenth-Century New York* (New York: W. W. Norton, 2006); and Homberger, *Scenes from the Life of a City*, chs. 1–2.

43. “The Dog Ordinance,” *BDE*, 11 May 1863, 2.

44. “Dogs,” *BDE*, 10 June 1873, 2.

45. “The Unmuzzled Dog Nuisance,” *BDE*, 20 July 1857, 2 (for the quotation about “rowdy and disorderly curs”).

46. “Home News,” *NYTr*, 8 February 1877, 8.

47. “Dog Bites a Patrolman,” *NYTr*, 15 September 1911, 3. Daniel Eli Burnstein, *Next to Godliness: Confronting Dirt and Despair in Progressive Era New York City* (Urbana: University of Illinois Press, 2006), ch. 3, addresses the larger context of pushcart regulation and its political meanings. For another early twentieth-century morality play involving a canine defense of human underdogs, see “Dog Got Conductor at Last,” *NYT*, 11 June 1904, 9, and “Thought He Had Rabies,” *NYTr*, 11 June 1904, 4.

48. On human dread of rabies, see Philip M. Teigen, “Legislating Fear and the Public Health in Gilded Age Massachusetts,” *Journal of the History of Medicine and the Allied Sciences* 62 (April 2007): 141–70, on 144–46; Ritvo, *The Animal Estate*, ch. 4, esp. 167–70; Kathleen Kete, “La Rage and the Bourgeoisie: The Cultural Context of Rabies in the French Nineteenth Century,” *Representations* 22 (Spring 1988): 89–107;

and Brett L. Walker, *The Lost Wolves of Japan* (Seattle: University of Washington Press, 2005), ch. 3.

49. “Corporation Matters,” *BDE*, 6 June 1842, 2. For other examples, see also [untitled], *NYTr*, 28 June 1843, 2; “Dogs,” *BDE*, 18 April 1851, 3; “War on the Dogs,” *BDE*, 26 June 1857, 2; and “The Unmuzzled Dog Nuisance,” *BDE*, 20 July 1857, 2.

50. “Dogs,” *BDE*, 19 July 1872, 3.

51. *Annual Report of the Board of Health of the Department of Health of the City of New York for the Year Ending December 31, 1906*, vol. II (New York: Martin B. Brown Company, 1907), 1098–1100.

52. “City Items—Health of the City,” *NYTr*, 25 April 1849, 1.

53. “A Disease that Needs Attention,” *NYT*, 14 July 1874, 4. As historian John Duffy once wryly observed, “Whether or not familiarity breeds contempt, it certainly breeds acceptance.” Duffy, *The Sanitarians: A History of American Public Health* (Urbana: University of Illinois Press, 1990), 2. One need only compare the automobile accidents that currently kill tens of thousands of Americans every year to the far lower risk of death by air travel, yet airline fatalities generate front-page headlines, while automobile deaths usually merit no more than perfunctory coverage.

54. Stashower, *The Beautiful Cigar Girl*, 112–21; Frank Luther Mott, *American Journalism: A History of Newspapers in the United States through 260 Years: 1690 to 1950* (New York: Macmillan, 1950), 220–27, 229–38, 243–44, 267–81.

55. “Hydrophobia,” *BDE*, 20 June 1861, 3.

56. “City Items,” *NYTr*, 22 July 1845, 2.

57. “City Items,” *NYTr*, 7 August 1846, 2; Letter to the Editor from “Safety,” “Mad Dogs,” *NYH*, 10 August 1846, 5; “City Items,” *NYTr*, 2 May 1853, 7; “A Mad Dog,” *NYT*, 6 July 1854, 8; “A Scare in the City Hall,” *NYH*, 5 July 1877, 9; “Wild Panic,” *BDE*, 18 August 1883, 4; “An Officer Bitten by a Dog,” *BDE*, 27 April 1886, 4; [untitled], *NYTr*, 6 August 1893, 6; “Long Island,” *NYTr*, 13 June 1896, 15; “Dog Killed and Boy Hit,” *NYT*, 1 August 1900, 12; “Dog Causes Panic,” *NYT*, 4 August 1901, 12; “Mad Dog on Broadway,” *BDE*, 26 July 1902, 1; “Fell into Excavation and Italian Laborers Thought of Rabies,” *NYT*, 23 August 1903, 12; “Dog Scattered Worshippers,” *NYT*, 16 April 1906, 6; “Dog Bites Four Boys,” *NYT*, 20 November 1906, 1; “Mongrel Attacks a Boy,” *NYT*, 28 April 1908, 3; “Dog Attacks Children,” *NYT*, 29 May 1908, 16; “Say Dog Who Bit Pupils Had Rabies,” *NYT*, 30 May 1908, 3; “Bull Terrier Bites Six on a Rampage,” *NYT*, 15 December 1909, 3; “Dog Scares Churchgoers,” *NYT*, 20 November 1911, 20.

58. “City Items: Mad Dog Killed,” *NYT*, 11 August 1858, 4.

59. “A Mad Dog as a Visitor,” *NYTr*, 29 August 1890, 10; see also “Visited by a Mad Dog,” *BDE*, 28 August 1890, 3.

60. See, for example, “Mad Dog Killed,” *NYT*, 30 June 1859, 5; “City and Suburban News: New-York,” *NYT*, 19 June 1874, 8; “City and Suburban News: New-York,” *NYT*, 27 June 1876, 10; “Fired Four Shots in Broadway,” *NYT*, 18 May 1889, 5; “The Unfortunate Dog,” *NYTr*, 23 June 1892, 6; “Supposed Rabid Dogs Killed,” *NYT*, 13 July 1896, 1.

With the shooting of dogs by both policemen and ordinary citizens on a fairly regular basis, it is a wonder that bystanders were not injured more often. For cases of close calls, and the occasional incident in which bystanders worried about developing hydrophobia after being struck inadvertently by a bullet that first passed through a suspected rabid animal, see “Very Slow Dogs,” *NYH*, 12 June 1877, 6; “Newark’s Dog Plague,”

NYH, 7 December 1885, 5; “The Unfortunate Dog,” *NYTr*, 23 June 1892, 6; “Dog Killed and Boy Hit,” *NYT*, 1 August 1900, 12; “Her Corset Stopped Erring Bullet,” *BDE*, 14 April 1902, 6; and “Rabies Bullet Hits Man,” *NYTr*, 6 July 1912, 14.

61. “Patients at Pasteur Institute,” *NYTr*, 7 February, 1897, 9; “Rabies in Sullivan County,” *BDE*, 4 February 1900, 21. In 1910, veterinary expert Langdon Frothingham affirmed that rabid dogs might cover a range of twenty to eighty miles. “The ‘Mad Dog’ Bogy [*sic*],” *NYT*, 9 January 1910, 12.

62. “Dog Bites Right and Left,” *NYTr*, 1 March 1896, 13; “Mad Dog Scare at Gravesend,” *NYT*, 13 February 1899, 1; “Dog Believed Rabid Bites Nine Children,” *NYT*, 1 April 1903, 2; “Yellow Dog Bites 7 on Washington Heights,” *NYT*, 4 May 1906, 5; “Mad Dog among Children,” *NYT*, 23 October 1906, 6; “Dog Bites Four Persons,” *NYT*, 19 January 1907, 3; “Dog Attacks Children,” *NYT*, 23 August 1911, 1; “Dog at Bath Beach Bites 11 Children,” *NYT*, 4 June 1920, 14.

63. Stansell, *City of Women*, ch. 10.

64. “Clubs No Good,” *BDE*, 15 June 1888, 6.

65. On the effects of the weather, see “Dog Bites Right and Left,” *NYTr*, 1 March 1896, 13.

66. “Desperate Fight with a Mad Bulldog,” *NYH*, 10 June 1891, 8.

67. “Killing Mad Dogs,” *BDE*, 13 June 1874, 3; “Utility of Muzzling Dogs—The Slaughter at the Pound,” *NYTr*, 20 June 1874, 2 (for the quotation). Children apparently also enjoyed following dogcatchers on their rounds. As one account put it, “The dog catcher’s wagon was followed by a crowd of howling and very much interested urchins. These urchins simply went wild when the catchers lifted the unsuspecting canines of the neighborhood into the rickety cage on the wagon.” [Untitled], *BDE*, 10 September 1893, 3.

68. “Mr. Chapin Hates Dogs,” *BDE*, 19 November 1887, 4.

69. “Supposed to Have Rabies,” *NYT*, 19 May 1897, 12.

70. “Mad Dog Creates a Panic,” *NYT*, 6 June 1899, 3; see also “Mad Dog in a Music Hall,” *NYTr*, 6 June 1899, 9.

71. “Bitten by a Mad Dog,” *BDE*, 25 September 1898, 32.

72. “Dog Causes a Panic,” *NYT*, 4 August 1901, 12; “Bulldog Bites Two Girls,” *NYTr*, 21 September 1912, 5.

73. “Rabid Dog Finally Killed,” *NYT*, 20 March 1903, 7.

74. “Crowds at the Sea-Shore,” *NYT*, 29 July 1878, 8; Homberger, *The Historical Atlas of New York City*, 128–29; Kathy Peiss, *Cheap Amusements: Working Women and Leisure in Turn-of-the-Century New York* (Philadelphia: Temple University Press, 1986), ch. 5.

75. “Drowned at Coney Island,” *NYT*, 26 July 1897, 2; “Coney Island Dog Scare,” *NYT*, 21 August 1903, 3; “Small Dog Bites 11 in Crowd at Coney,” *NYT*, 25 August 1907, 2; “Dog Scares Coney Bathers,” *NYT*, 31 August 1910, 4; “Dog Terrorized Coney,” *NYT*, 13 July 1911, 7.

76. Katherine C. Grier has noted that training manuals with advice on how to make dogs “civilized” became increasingly available in the second half of the nineteenth century, but one suspects that they did not penetrate far beyond bourgeois pet-keeping circles. Grier, *Pets in America*, 96–97.

77. “A Dog on the Rampage,” *NYT*, 28 January 1881, 3.

78. [Untitled], *NYTr*, 16 February 1869, 4; [Untitled], *NYTr*, 16 February 1869, 4; “Treatment of Stray Dogs,” *BDE*, 30 May 1892, 2; “Mad Dog Hunted with Water,” *NYT*, 22 June 1893, 1; “‘Mad’ Dogs in Central Park,” *NYTr*, 6 November 1894, 5; “Dogs in Dogdays,” *NYTr*, 10 August 1902, A12; “Dog Bites Six People,” *NYTr*, 28 November 1905, 10. On the rapid diagnosis of rabies, see *Annual Report of the Board of Health of the Department of Health of the City of New York for the Year Ending December 31, 1905*, vol. I (New York: Martin B. Brown Company, 1906), 17; Anna W. Williams, “Negri Bodies, with Special Reference to Diagnosis in Suspected Rabies,” in *Annual Report of the Board of Health of the Department of Health of the City of New York for the Year Ending December 31, 1905*, vol. II (New York: Martin B. Brown Company, 1906), 479–82; and the discussion in ch. 4. Statistics for dogs examined and diagnosed with rabies by the health department in 1908 are found in *Annual Report of the Board of Health of the Department of Health of the City of New York for the Year Ending December 31, 1908*, vol. I (New York: Martin B. Brown, Company, 1909), 276.

79. For evidence of rabies in rural areas as a concern of the New York State Department of Agriculture during the turn of the century, see, for example, “Rabies in Western New York,” *NYT*, 17 September 1899, 15; “Erie County Quarantined,” *NYT*, 20 September 1899, 1; “Signed by Gov. Roosevelt,” *NYT*, 16 March 1900, 8; “Rabies among Cattle at Montgomery,” *NYT*, 19 July 1903, 11; and “Rabies Rife in Orange County Town,” *NYT*, 8 August 1903, 1.

80. Pemberton and Worboys, *Mad Dogs and Englishmen*, 91; Horatio R. Bigelow, *Hydrophobia* (Philadelphia: D. G. Brinton, 1881), 69; H. Bouley, *Hydrophobia: Means of Avoiding Its Perils and Preventing Its Spread, as Discussed at One of the Scientific Soirees of the Sorbonne*, trans. A. Liautard (New York: Harper and Brothers, 1874), 39–40. Nor did the relationship between gender, clothing, and vulnerability to rabid dogs escape the notice of everyday observers. In 1857, for example, a newspaper report noted that a woman in New York “was saved from the bite of a mad dog . . . by that much ridiculed appendage to female dress—a hoop.” “Mad Dogs,” *NYH*, 16 July 1857, 1.

81. See tables 1 and 2 in appendix 1. The figures based on stories in the *Times* are in no way comprehensive, and it is difficult to gauge the representativeness of these incidents given the gaps suggested by contemporaneous public health statistics. For example, in 1909, the Department of Health handled more than two thousand dog bite complaints from the five boroughs, well beyond the number of individual reports that made it into the newspapers. *Annual Report of the Board of Health of the Department of Health of the City of New York for the Year Ending December 31, 1909* (New York: Martin B. Brown Company, 1911), 62. Large disparities also characterize anecdotal newspaper coverage of rabies deaths versus public health statistics. The Board of Health’s statistics listed twenty-five hydrophobia deaths in New York City for the decade of the 1860s, as opposed to just six such deaths reported in the *Times* for New York and Brooklyn combined. The gap was smaller in the 1880s: nine hydrophobia deaths according to public health data, as opposed to seven in the *Times* for New York City. For the years 1900 to 1905, NYCDH data listed eighteen hydrophobia deaths in New York City, versus ten that appeared in the *Times*’ pages in that period. *Annual Report of the Board of Health of the Department of Health of the City of New York for the Year Ending December 31, 1906*, vol. II (New York: Martin B. Brown Company, 1907), 1098–1100. Yet, despite the lack of comprehensiveness, the basic consistency of the *Times*-based numbers with medical

statistics from the time period at least suggests they constitute no less accurate a reflection of nineteenth-century social reality.

82. See appendix 1, table 2 for the relevant data derived from the *New York Times*. On gender ratios among adults in New York City, consult Stansell, *City of Women*, 83–84, and Spann, *The New Metropolis*, 27. According to US Census figures for 1860, the population of women over the age of 15 was about 9 percent larger than the male population in New York County and nearly 14 percent larger in Kings County. Department of the Interior, *Population of the United States in 1860; Compiled from the Original Returns of the Eighth Census* (Washington, DC: Government Printing Office, 1864), 322–27. By 1890, the gender differential narrowed to the range of about 5–6 percent in New York and Brooklyn, and it was close to even by 1910. Department of the Interior, Census Office, *Report on Vital and Social Statistics in the United States at the Eleventh Census: 1890. Part II—Vital Statistics. Cities of 100,000 Population and Upward* (Washington, DC: Government Printing Office, 1896), 338–39, 348–49; Department of Commerce, Bureau of the Census, *Thirteenth Census of the United States Taken in the Year 1910*, vol. III, *Population 1910: Reports by States, with Statistics for Counties, Cities and Other Civil Divisions* (Washington, DC: Government Printing Office, 1913), 220.

83. General population data for New York City and the surrounding area has been drawn from the following: Department of the Interior, *Population of the United States in 1860*, 312–13, 322–27; Department of the Interior, Census Office, *Report on Vital and Social Statistics in the United States at the Eleventh Census: 1890. Part II—Vital Statistics. Cities of 100,000 Population and Upward*, 338–39, 344–45, 348–49; and Department of Commerce, Bureau of the Census, *Thirteenth Census of the United States Taken in the Year 1910*, vol. III, *Population 1910*, 137, 220. My dog bite data, as presented in appendix 1, categorizes children as aged 16 and under, so it is not entirely compatible with the census data. A redefinition to 15 and under, however, would move just two “children” into the adult category. Given the uncertainties about representativeness in the *New York Times*’ coverage, the analysis also did not appear to merit more elaborate statistical manipulation. Nonetheless, the basic impression of children’s significantly higher risk seems clear and accurate.

84. Randall Lockwood, “The Ethology and Epidemiology of Canine Aggression,” in *The Domestic Dog: Its Evolution, Behaviour, and Interactions with People*, ed. James Serpell (Cambridge: Cambridge University Press, 1995), 132–38; Angelo Monroy et al., “Head and Neck Dog Bites in Children,” *Otolaryngology—Head and Neck Surgery* 140 (2009): 354–57; Johannes Schalamon et al., “Analysis of Dog Bites in Children Who Are Younger Than 17 Years,” *Pediatrics* 117 (March 2006): 374–79.

85. Grier, *Pets in America*, ch. 3 discusses Victorian ideas about kindness to animals. For examples of the persistence of dog bite incidents involving taunting by children in the early twentieth century, see, for example, “Dog Bites Six People,” *NYTr*, 28 November 1905, 10; “Fire Dog Bites Seven Boys,” *NYT*, 15 July 1907, 1; and “Bitten by Dog She Teased,” *NYT*, 24 April 1910, 10.

86. See, for example, “Attacked by a Bulldog,” *BDE*, 16 July 1885, 4; “Child Bitten by Bulldog,” *NYT*, 24 March 1904, 5; and “Moran’s Dog Bites a Boy,” *NYT*, 13 October 1916, 7. Although dog bite victims could seek civil penalties in court against owners of vicious dogs, the assumption that properly trained dogs do not bite people is probably a post-

World War II phenomenon. That latter point, however, still requires verification. Personal conversation with Steve Zawistowski, ASPCA, February 2011.

87. Stansell, “Women, Children, and the Uses of the Street: Class and Gender Conflict in New York City, 1850–1860”; Stansell, *City of Women*, 180–92, 204–9; Timothy J. Gilfoyle, “Street-Rats and Gutter-Snipes: Child Pickpockets and Street Culture in New York City, 1850–1900,” *Journal of Social History* 37 (Summer 2004): 853–82.

88. Gilfoyle, *A Pickpocket's Tale*, 25–28; Melosi, *Garbage in the Cities*, 57–59.

89. Peter C. Baldwin, “‘Nocturnal Habits and Dark Wisdom’: The American Response to Children in the Streets at Night, 1880–1930,” *Journal of Social History* 35 (Spring 2002): 593–611.

90. “City Items,” *NYTr*, 16 August 1855, 7; “Death from Hydrophobia,” *BDE*, 4 October 1858, 3.

91. “Hydrophobia,” *NYH*, 9 June 1881, 8; “City and Suburban News—New York,” *NYT*, 2 July 1883, 8; “Child Bitten by a Dog,” *BDE*, 17 May 1896, 1; “Long Island,” *NYTr*, 13 June 1896, 15; “Was the Dog Mad?” *BDE*, 31 January 1899, 8; “Babylon's Mad Dogs,” *BDE*, 7 December 1900, 11; “Children Bitten by Mad Dog,” *BDE*, 20 May 1902, 1; “Boy Hero Killed by Rabies,” *NYTr*, 2 February 1908, 16; “Mad Dog Bites Six Boys,” *NYTr*, 11 June 1908, 3; “Bulldog Attacks a Child,” *NYT*, 22 March 1910, 2; “Dog Bites Three Boys,” *NYT*, 7 August 1912, 20; “Dog Bites Three Children,” *NYTr*, 30 July 1921, 4. Before the 1890s, newspaper stories about children bitten by dogs rarely provided details about the social context in which incidents took place. For example, in a typical account, the *New York Times* reported the following in the fall of 1876: “A dog suffering from rabies bit Margaret Carroll, aged four years, of No. 6 Vanderbilt avenue [Brooklyn], last evening. The dog was killed by the Police.” “Brooklyn,” *NYT*, 21 October 1876, 10. Was Margaret at play? Indoors or outdoors? In front of her own home? Under the supervision of an adult or another child? It is simply impossible to say—hence the predominance here of citations after 1890.

92. “Four Bitten by a Dog,” *NYT*, 17 October 1905, 1.

93. “Dog Bites Four Boys,” *NYT*, 20 November 1906, 1; “Dog Attacks Children,” *NYT*, 29 May 1908, 16; “Say Dog Who Bit Pupils Had Rabies,” *NYT*, 30 May 1908, 3; “Bulldog Bites Policeman,” *NYT*, 14 April 1911, 5; “Dog Bites Two Children,” *NYT*, 9 December 1913, 1; “Dog Attacks Schoolgirls,” *NYT*, 24 June 1916, 6.

94. “Dog Attacks Two Children,” *NYTr*, 16 December 1907, 12; “Dog Attacks a Boy,” *NYT*, 12 April 1910, 3.

95. Karen Halttunen, *Confidence Men and Painted Women: A Study of Middle-Class Culture in America, 1830–1870* (New Haven, CT: Yale University Press, 1982), 115; Rosenzweig and Blackmar, *The Park and the People*, 221; Stansell, *City of Women*, 27 and 69; John, *Spreading the News*, 164–66; Patricia Cline Cohen, *The Murder of Helen Jewett: The Life and Death of a Prostitute in Nineteenth-Century New York* (New York: Vintage Books, 1999; originally published by Alfred A. Knopf, 1998), 140–41.

96. Rosenzweig and Blackmar, *The Park and the People*, 215–31, 323.

97. Charles E. Rosenberg, “Making It in Urban Medicine: A Career in the Age of Scientific Medicine,” *Bulletin of the History of Medicine* 64 (1990): 163–86, on 173n46.

98. David von Drehle, *Triangle: The Fire That Changed America* (New York: Atlantic Monthly Press, 2003), 41–48 (on the structure of work and production in the garment

industry); *Preliminary Report of the Factory Investigating Commission*, vol. 1 (Albany, NY: Argus Company, 1912), 86, 573–80 (on tenement-based occupations ca. 1912). A photograph of coffee-sorters appeared in appendix VII of the report “Photographs Submitted by the Consumers’ League and Miss Lillian Wald of the Nurses’ Settlement, New York,” unpaginated. Alice Kessler-Harris, in her history of women and work, noted the persistence of the putting-out system in a wide range of industries well into the 1930s. Kessler-Harris, *Out to Work: A History of Wage-Earning Women in the United States* (Oxford: Oxford University Press, 1982), 269–70.

99. William Burns, *Life in New York, In Doors and Out of Doors* (New York: Bunc and Brothers, 1851); Stansell, *City of Women*, chs. 3–4, 6, and 8; Peiss, *Cheap Amusements*, ch. 2. Burns’s *Life in New York* consisted of a series of some forty didactic profiles of women at work. Despite the subtitle, only the occupations of fruit vender, market woman, apple woman, and street minstrel took place outdoors. According to Christine Stansell, from the perspective of moral reformers, acceptable employments for women in need included “waged sewing, other put-out work, and domestic service,” while street peddling and taking in boarders, not to mention prostitution, were verboten. Stansell, *City of Women*, 69–73, quotation on 73. Not coincidentally, the list of approved occupations kept women in private spaces and minimized contact with men outside the family. But such restrictions were not simply the product of a middle class engaged in a project of social control and uplift. When Mary Rogers went to work at John Anderson’s cigar shop in 1838, her mother insisted that she never work alone in the shop and that an escort take her home at the end of the day. Stashower, *The Beautiful Cigar Girl*, 17.

100. Peiss, *Cheap Amusements*, 8.

101. Stansell, *City of Women*; see also Stott, *Workers in the Metropolis*, ch. 9.

102. Peiss, *Cheap Amusements*.

103. Mary van Kleeck, *Artificial Flower Makers* (New York: Survey Associates, 1913), 95.

104. Peiss, *Cheap Amusements*, 25, 27.

105. See appendix 1, table 2. Not counting the two men who died without a known history of animal bite, ten out of the twenty-one men died from rabies transmitted by their own pets. An eleventh suffered a deadly bite from a communal office dog, while the other ten men were bitten by dogs with no known owner or other previous history.

106. Cynthia Eagle Russett, *Sexual Science: The Victorian Construction of Womanhood* (Cambridge, MA: Harvard University Press, 1989), intro., chs. 1, 2, and 4; Gail Bederman, *Manliness and Civilization: A Cultural History of Gender and Race in the United States, 1880–1917* (Chicago: University of Chicago Press, 1995), ch. 3; Diane B. Paul, *Controlling Human Heredity: 1865 to the Present* (Atlantic Highlands, NJ: Humanities Press, 1995), chs. 3–5.

107. “Two New Institutions,” *NYTr*, 14 July 1866, 5.

108. “Mad Dogs,” *BDE*, 30 June 1874, 4.

109. “More Hydrophobia,” *BDE*, 11 July 1881, 2. For more Brooklyn-based commentary, see, for example, [untitled], *BDE*, 12 May 1876, 2; “Dogs,” *BDE*, 8 July 1877, 2; [untitled], *BDE*, 17 March 1878, 2; [untitled], *BDE*, 25 April 1879, 2; and “Horrors of Hydrophobia,” *BDE*, 11 February 1881, 2.

110. Letter to the Editor from F. S. D., “To Prevent Hydrophobia,” *NYTr*, 15 June

1890, 7. For another newsreader's similar lament two decades earlier, see Letter to the Editor, "Slaughter the Dogs," *NYH*, 6 January 1870, 5.

111. "Dog Days in May," *NYTr*, 9 May 1877, 4.

112. "The Merry Hydrophobia and the Cur," *BDE*, 14 July 1879, 2.

113. "A Whited Canine Sepulchre," *NYT*, 24 May 1876, 4.

114. Ritvo, *The Animal Estate*, ch. 2; Mark Derr, *A Dog's History of America: How Our Best Friend Explored, Conquered, and Settled a Continent* (New York: North Point Press, 2004), ch. 10; Grier, *Pets in America*, 37–41.

115. "The Cultivated Dog," *NYTr*, 15 May 1878, 4. The *Brooklyn Daily Eagle's* coverage of the Westminster Kennel Club show four years later also underscored the virtues of good breeding, as well as the menace of biological decline: "Progress and development are acquired only by a ceaseless war with nature, and the untutored and unguarded dog is shockingly apt in a few generations to become a cur." "Dogs and Curs," *BDE*, 20 April 1882, 2.

116. "Beware of the Dog," *NYH*, 16 March 1877, 4.

117. L. L. Dorr, "Rabies—A Possible Cause and a Probable Preventive," *NYMJ* 34 (November 1881), 470–76, on 473.

118. On nativist anxieties about immigration in the late nineteenth century, see Bederman, *Manliness and Civilization*, ch. 1, and Higham, *Strangers in the Land*, ch. 4.

119. "All About the Dog Trade," *NYT*, 11 March 1877, 5; "Dog Days in May," *NYTr*, 9 May 1877, 4; "A Spitz Bit Him," *BDE*, 16 August 1889, 6.

120. "The Mad Dogs," *NYTr*, 8 March 1891, 6.

121. Theodore Roosevelt, "The Strenuous Life," address delivered before the Hamilton Club, Chicago, IL, 10 April 1899, available at <http://www.bartleby.com/58/1.html> (accessed December 21, 2018).

122. "The Hydrophobia Scare," *BDE*, 25 February 1869, 2.

123. "Women and Poodles," *BDE*, 17 September 1880, 2; "Dogs and Muzzles," *NYT*, 19 April 1903, 6; Edward Marshall, "Pasteur Expert Sounds Warning against Pet Dogs," *NYT*, 27 August 1911, SM11.

124. See, for example, Letter to the Editor from "E.S.C.," "Dogs," *BDE*, 13 April 1872, 1; "Mad Dogs," *NYT*, 28 June 1874, 4; and "Scientific Gossip," *NYT*, 26 February 1882, 4. Some medical opinion even suggested that cancer attacked animals deprived of natural vigor by domestication: "They are made more subject to the disease when in a state of domestication than in their natural wild condition." "Cancer and the Doctors," *NYH*, 5 December 1887, 9.

125. Beckert, *The Monied Metropolis*, 154.

126. On the general history of neurasthenia, see Andrew Scull, *Hysteria: The Biography* (Oxford: Oxford University Press, 2009), ch. 5, and Roy Porter, "Nervousness, Eighteenth and Nineteenth Century Style: From Luxury to Labour," in *Cultures of Neurasthenia from Beard to the First World War*, ed. Marijke Gijswijt-Hofstra and Roy Porter (Amsterdam: Rodopi, 2001), 31–49. On neurasthenia in the United States, consult David G. Schuster, *Neurasthenic Nation: America's Search for Health, Happiness, and Comfort, 1869–1920* (New Brunswick, NJ: Rutgers University Press, 2011); Bederman, *Manliness and Civilization*, 77–87; and Charles E. Rosenberg, "George M. Beard and American Nervousness," in *No Other Gods: On Science and American Social Thought* (Baltimore: Johns Hopkins University Press, 1976), 98–108.

127. “Ugly Dogs to Be Watched,” *BDE*, 29 March 1897, 6.
128. *OAF* 23 (June 1896): 221, reprinted from the *London Daily News*.
129. “Dr. Elmer Lee on Rabies, Hydrophobia, and the Pasteur Treatment,” *OAF* 25 (November 1897): 49–50, quotation on 50.
130. Dolores Bacon, “As to Dogs,” *NYT*, 12 January 1902, SM13.
131. Dinah Sharpe, “When Dogs Become Mad,” *NYT*, 5 July 1891, 17. In a similar vein, in 1901 the *Brooklyn Daily Eagle* admonished readers “that some dogs, as well as some people, have nerves.” Consequently, strays were not the only source of hydrophobia: “The pampered, overfed” dog also “has fits or rabies, and does harm.” “Care of Dogs in Summer,” *BDE*, 15 July 1901, 8, excerpted from the *Babylon Signal*.
132. As the *New York Herald* explained, “Cancer, like insanity, follows in the wake of civilization, and as the ferment of a state of high social advancement is among the most active causes of destruction of intellect[,] so too it plays a prominent part in generating one of the most terrible physical evils to which humanity is subject.” “Cancer and the Doctors,” *NYH*, 5 December 1887, 9.

Chapter 2 • Human and Non-Human Suffering

1. Michael Haines, “Life Expectancy,” in *The Oxford Companion to United States History*, ed. Paul S. Boyer (Oxford: Oxford University Press, 2001), 444–45; Clayne L. Pope, “Adult Mortality in America before 1900: A View from Family Histories,” in *Strategic Factors in Nineteenth Century American Economic History: A Volume to Honor Robert W. Fogel*, ed. Claudia Goldin and Hugh Rockoff (Chicago: University of Chicago Press, 1992), 267–96, on 277; Edward K. Spann, *The New Metropolis: New York City, 1840–1857* (New York: Columbia University Press, 1981), 135, 461n53; David Rosner, “Introduction: ‘Hives of Sickness and Vice,’” in *Hives of Sickness: Public Health and Epidemics in New York City*, ed. David Rosner (New Brunswick, NJ: Rutgers University Press, 1995), 1–21, on 3; Gretchen A. Condran, “Changing Patterns of Epidemic Disease in New York City,” in *Hives of Sickness*, 27–41, on 33; “The Health of New York,” *NYH*, 13 March 1881, 12; John Duffy, *A History of Public Health in New York City, 1866–1966* (New York: Russell Sage Foundation, 1974), 643. By comparison, the mortality rate in New York City in 2015 was about 1 in 159, or more than three and a half times lower than in the 1890s. Mortality statistics from NYC Health available online at: <https://a816-healthpsi.nyc.gov/epiquery/VS/index.html> (accessed December 26, 2018).
2. Richard R. John, *Spreading the News: The American Postal System from Franklin to Morse* (Cambridge, MA: Harvard University Press, 1995), 30–38; Menahem Blondheim, *News over the Wires: The Telegraph and the Flow of Public Information in America, 1844–1897* (Cambridge, MA: Harvard University Press, 1994), part I; Michael Emery, “Newspapers,” in *The Encyclopedia of New York City*, ed. Kenneth T. Jackson (New Haven, CT: Yale University Press and New York: New-York Historical Society, 1995), 809–21.
3. “Current Events,” *BDE*, 16 August 1888, 2; “Recent Events,” *BDE*, 4 January 1892, 4.
4. “Death from Hydrophobia,” *NYT*, 23 January 1854, 1; “Death from Hydrophobia,” *BDE*, 23 June 1887, 6.
5. “He Died from Hydrophobia,” *NYTr*, 7 June 1895, 1.
6. “Death Caused by Hydrophobia,” *NYT*, 13 October 1879, 1; “Death from Hydrophobia,” *NYTr*, 26 February 1882, 2.

7. “Philadelphia,” *NYH*, 27 January 1848, 4; “Death from Hydrophobia,” *NYTr*, 24 August 1858, 3; “Is This Charley Ross?” *NYH*, 20 June 1881, 9.

8. Charles D. Homans, *A Case of Hydrophobia*, read before the Boston Society for Medical Observation, 6 March 1854; Thomas W. Blatchford, “Cases of Hydrophobia,” reprinted from the *Boston Medical and Surgical Journal* (submitted July 1854); J. Lewis Smith, *Report of a Case of Hydrophobia; with Statistical Observations* (New York: Holman and Gray, 1856), 18–24; handwritten manuscript by Thaddeus Mills Halsted, read at a meeting of the New York Medical and Surgical Society, 15 January 1857; Thomas H. Gage, *A Case of Hydrophobia: With Remarks* (Worcester, MA: Worcester District Medical Society, 1865[?]) (read before the Worcester District Medical Society, January 1865); “Cases with Hydrophobic Symptoms” (1880), Bound Pamphlet 393, all in the New York Academy of Medicine Library, New York, NY; and Horatio R. Bigelow, *Hydrophobia* (Philadelphia: D. G. Brinton, 1881), ch. 5.

9. “Cases with Hydrophobic Symptoms” (1880), Bound Pamphlet 393, New York Academy of Medicine Library.

10. See, for example, “Death from Hydrophobia,” *BDE*, 4 October 1858, 3; “Dreadful Death from Hydrophobia,” *BDE*, 21 March 1859, 11, reprinted from the *Cincinnati Enquirer*; “Death of a Boy by Hydrophobia,” *BDE*, 10 August 1859, 2; “Home News,” *NYTr*, 3 April 1868, 8; and “A Distressing Case of Death by Hydrophobia,” *NYT*, 18 May 1870, 2.

11. “Horrible: A Case of Hydrophobia in a Catholic Convent,” *BDE*, 13 July 1883, 4; “Dying from Hydrophobia,” *NYTr*, 23 January 1891, 4; “A Month’s Mortality,” *BDE*, 4 October 1899, 9. During the late nineteenth century, the city coroner also lumped hydrophobia deaths with accidents and violent deaths. “Crime and Accident,” *NYH*, 2 January 1879, 2.

12. “A Boy Dies from Hydrophobia,” *NYTr*, 22 June 1889, 1.

13. “New-Jersey,” *NYT*, 20 December 1873, 12; “Death Follows Dog’s Bite,” *NYT*, 1 September 1901, 8.

14. In making this claim, I do not mean to discount the culture-specific ways in which suffering individuals likely perceived the process of their own deaths. See Allan Kellehear, *A Social History of Dying* (Cambridge: Cambridge University Press, 2007), 1, 24. I also wish to emphasize, however, that to the extent one takes seriously the agency of the microbe, and to the extent that common physiological characteristics bind humans across time, disease possessed the ability to impose certain types of uniformity in physical experience even across cultural boundaries. On the agency of the microbe, see Bruno Latour, *The Pasteurization of France*, trans. Alan Sheridan and John Law (Cambridge, MA: Harvard University Press, 1988; originally published as *Les microbes: guerre et paix suivi de irréductions*, Paris: A. M. Métailié, 1984).

15. To some extent, the label “hydrophobia” implied the contracting of the disease, whereas “rabies” indicated its transmission, but usages along these lines were hardly consistent, and terminology remained a source of contention throughout most of the century. Slippages existed between rabies and hydrophobia as disease categories throughout the nineteenth century. American physician James Thacher, in his 1812 treatise on hydrophobia, invoked the transitional category of “rabid hydrophobia” in order to connote the resistance to swallowing liquids identified with human cases of hydrophobia contracted through the bite of a rabid dog, as opposed to other hydro-

phobic conditions not associated with animal bites. Thacher, *Observations on Hydrophobia, Produced by the Bite of a Mad Dog, or Other Rabid Animal* (Plymouth, MA: Joseph Avery, 1812), 44. In 1833, English physician J. L. Bardsley's encyclopedia entry on hydrophobia similarly referred to "rabid hydrophobia," and it also noted that "the hydrophobia of dogs has been known from the earliest ages." Bardsley, "Hydrophobia," in *The Cyclopaedia of Practical Medicine*, ed. John Forbes, Alexander Tweedie, and John Conolly, vol. II (London, 1883), 483–518, quotations on 491 and 489, respectively. Thomas W. Blatchford, in the American Medical Association's 1856 report on hydrophobia, also found an English reference from 1792 that mentioned several people bitten by "a cow that had the hydrophobia." Nineteenth-century sources almost never referred to humans as suffering from rabies, but in a rare exception, Blatchford also mentioned the 1792 incident as involving "two rabid human beings." Blatchford, *Hydrophobia: Its Origins and Development, as Influenced by Climate, Season, and Other Circumstances. Being the Report of the Special Committee Appointed by the American Medical Association, and Read at the Meeting in Detroit, MI, May, 1856* (Philadelphia: T. K. and P. G. Collins, 1856), 6.

Later in the century, some of the major treatises from both sides of the Atlantic in the 1870s and 1880s insisted that hydrophobia, while an imperfect label given the symptomatic variations of the actual disease condition, applied properly only to humans, whereas rabies or madness referred to the disease in animals. See, for example, George Fleming, *Rabies and Hydrophobia: Their History, Nature, Causes, Symptoms, and Prevention* (London: Chapman and Hall, 1872), ix, 1–6; and Bigelow, *Hydrophobia*, 9. Other authorities, however, freely described dogs and other animals as hydrophobic. William A. Hammond, *A Treatise on Diseases of the Nervous System* (New York: D. Appleton and Company, 1871), 552; H. Bouley, *Hydrophobia: Means of Avoiding Its Perils and Preventing Its Spread*, trans. A. Liautard (New York: Harper and Brothers, 1874), 8–27; Charles P. Russel, "Hydrophobia in Dogs and Other Animals," in *Fifth and Sixth Annual Reports of the Board of Health of the Health Department of the City of New York. May 1, 1874 to December 31, 1875* (New York: Martin B. Brown Company, 1876), 716–63, on 716, 718, 726, 733, 736, 756, and elsewhere.

As noted in the introduction, only well into the twentieth century did rabies become the widely accepted label for describing a single disease in both animals and humans.

16. "General Notes, NYT, 23 February 1879, 7; "A Rabid Cow," NYT, 25 November 1886, 5; "A Mad Dog Attacks Cattle," NYT, 19 September 1897, 13.

17. Clay McShane and Joel A. Tarr, *The Horse in the City: Living Machines in the Nineteenth Century* (Baltimore: Johns Hopkins University Press, 2007), 11, 18–27, 92–95, quotation on 27; Benjamin G. Rader, *American Sports: From the Age of Folk Games to the Age of Televised Sports*, 5th ed. (Upper Saddle River, NJ: Prentice Hall, 2004), 37, 49–50.

18. "Death of a Horse from Hydrophobia," BDE, 28 May 1862, 3.

19. "News Summary," BDE, 23 December 1873, 4.

20. "Valuable Dogs Killed," NYT, 23 June 1885, 8.

21. Mark Derr, *A Dog's History of America: How Our Best Friend Explored, Conquered, and Settled a Continent* (New York: North Point Press, 2004), 235–36.

22. "J. P. Morgan's Prize Dog Dead," NYT, 17 July 1898, 9.

23. “New by the Mails,” *NYT*, 17 February 1853, 6; “Cows Die from a Dog’s Bite,” *NYT*, 31 July 1889, 1; “Victims of Hydrophobia,” *NYT*, 8 June 1891, 2.

24. Correspondence of the Monroe, PA, *Democrat*, reproduced in *NYTr*, 26 October 1843, 2; “Miscellaneous,” *NYTr*, 25 March 1859, 7; “Miscellaneous Items,” *BDE*, 1 May 1866, 1; “A Mad Horse,” *BDE*, 5 December 1874, 4; “Symptoms of Madness in a Colt,” *NYT*, 2 September 1883, 2; “The Horse Went Mad and Was Killed,” *NYT*, 4 March 1892, 9; and “Horse Frantic with Hydrophobia,” *NYT*, 12 May 1894, 1.

25. *Lafayette Courier* article reprinted as “A Mad Horse—An Interesting Case of Hydrophobia,” *BDE*, 28 July 1865, 1 (and also reprinted in *NYT*, 29 July 1865, 2); “Hydrophobia in a Horse,” *NYT*, 18 September 1876, 5; “Holstein Cows Go Mad,” *NYTr*, 30 November 1904, 1.

26. “A Dog’s Bite,” *NYH*, 22 December 1880, 8; “A Shocking Fate,” *NYH*, 9 September 1882, 5; “The News of New Jersey,” *NYH*, 2 April 1886, 9.

27. Diane L. Beers, *For the Prevention of Cruelty: The History and Legacy of Animal Rights Activism in the United States* (Athens: Swallow Press / Ohio University Press, 2006), 60–66.

28. “A Horse That Had Hydrophobia,” *NYTr*, 27 December 1885, 5.

29. See Jean Théodoridès, *Histoire de la Rage: Cave Canem* (Paris: Masson, 1986), 18–19; Brett Walker, *The Lost Wolves of Japan* (Seattle: University of Washington Press, 2005), 116–118; Kathleen Kete, *The Beast in the Boudoir: Petkeeping in Nineteenth-Century Paris* (Berkeley: University of California Press, 1994), 101; and Bill Wasik and Monica Murphy, *Rabid: A Cultural History of the World’s Most Diabolical Virus* (New York: Penguin Books, 2012), ch. 3.

30. During the turn of the century, anthropologist James George Frazer generated enormous controversy when he famously challenged readers to recognize the overlap between Christian religion and the belief systems of other, supposedly “primitive” peoples worldwide. Frazer, *The Golden Bough: A Study in Magic and Religion*, new abridgment from the 2nd and 3rd editions (London: Oxford University Press, 1994; first edition published in 1890). Although Frazer’s compilation of myths and magical beliefs earned a wide readership, the primitive/civilized dichotomy remained, and it formed an important component of Claude Lévi-Strauss’s critique in the early 1960s, when he took anthropologists to task for their adherence to “the totemic illusion.” Anthropologists’ own misplaced devotion to notions of “civilization,” which semantically associated “primitive” peoples with nature and their own societies with culture, he argued, created a divide where otherwise none existed. Lévi-Strauss, *Totemism*, trans. Rodney Needham (Boston: Beacon Press, 1962; originally published as *Le totémisme aujourd’hui*, Paris: Presses Universitaires de France, 1962), intro., esp. 1–3, 10, and ch. 1 (the quoted phrase appears on 17). On the historical process by which the English-speaking world came to repudiate open belief in magic, see Keith Thomas’s classic account: Thomas, *Religion and the Decline of Magic* (New York: Charles Scribner’s Sons, 1971). Consider also Eugene D. Genovese’s observation about the slaveholding American south: “The readiness of the slaveholders to denounce black folk beliefs as so much superstition to be exorcised by proper Christian instruction betrayed a studied unwillingness to consider the history of their own religion. . . . Early Christianity itself absorbed much from the so-called pagan cults. . . . Christianity never ceased assimilating pagan beliefs to itself, and had it ceased, it probably could not have maintained its hold on the masses.”

Genovese, *Roll, Jordan, Roll: The World the Slaves Made* (New York: Vintage Books, 1976; originally published 1974), 229.

31. Carlo Ginzburg, *Ecstasies: Deciphering the Witches' Sabbath*, trans. Raymond Rosenthal and ed. Gregory Elliott (London: Hutchinson Radius, 1990; originally published in Italian by Giulio Einaudi Editore, 1989), 10.

32. Ginzburg, *Ecstasies*, 24.

33. "Sad Case of Hydrophobia," *NYTr*, 9 January 1861, 3. See also "Mail Gleanings," *NYTr*, 5 August 1852, 7, for a case from New Jersey.

34. "Another Terrible Death," *NYH*, 11 July 1874, 3; "Dying from a Mad Dog's Bite," *BDE*, 18 February 1896, 1. See also "Hydrophobia," *BDE*, 5 July 1876, 4, and [untitled], *BDE*, 11 July 1881, 2, for additional examples.

35. "A Rabid Horse," *BDE*, 7 August 1888, 4; "Horse Dies of Hydrophobia," *BDE*, 11 November 1901, 8. See also "Hydrophobia in a Horse," *NYH*, 1 August 1874, 3; "Equine Hydrophobia," *NYH*, 7 August 1888, 9; and "'Mad' Donkey Shot," *NYT*, 5 January 1907, 1.

36. Account by "Dr. G.," reported by George Hayward, *Case of Hydrophobia* (Boston: David Clapp [Medical and Surgical Journal Office], 1854), 7. Copy at the New York Academy of Medicine Library. In 1856, New York physician J. Lewis Smith similarly reported on a case in which the patient's symptoms included respiratory irregularities "best expressed, perhaps, without any superstitious reference by the term panting." Smith, *Report of a Case of Hydrophobia*, 3.

37. Gage, *A Case of Hydrophobia*, 5.

38. [Untitled editorial], *NYTr*, 26 January 1886, 4; "Preventing Hydrophobia," *NYTr*, 26 January 1886, 2.

39. "Hydrophobia: A Physician Calls It an Ignorant and Superstitious Fallacy," *BDE*, 22 February 1887, 4.

40. "A Young Man Died from Hydrophobia," *NYTr*, 3 September 1889, 1.

41. "Dying in Agony of Genuine Rabies," *NYTr*, 29 November 1887, 2; "Death from Hydrophobia—Kendall's Terrible Sufferings," *NYTr*, 24 January 1891, 5.

42. "Dying from Hydrophobia—The Victim a Boy Bitten a Month Ago," *NYTr*, 13 August 1891, 1; "Died from a Pet Dog's Bite," *BDE*, 17 July 1893, 10. For other examples, see "He Barked Like a Dog," *NYTr*, 19 April 1895, 1, and "Died from Hydrophobia," *NYTr*, 1 February 1899, 14.

43. "Hydrophobia—The Case of Capt. Williams," *BDE*, 17 August 1852, 2.

44. "Hydrophobia's Victim," *NYH*, 15 May 1886, 8.

45. [Untitled], *NYT*, 12 January 1857, 5.

46. "Singular Case," *BDE*, 11 November 1873, 4 (for the quotations); "Hydrophobia in Brooklyn," *NYH*, 11 November 1873, 4.

47. "Hydrophobia Kills Girl," *NYTr*, 13 September 1905, 1.

48. "The Madstone," *BDE*, 24 September 1886, 2, reprinted from the *Kansas City Times*. The madstone will be discussed at length in chapter 3.

49. "Girl Neighs Like a Horse," *NYTr*, 24 February 1912, 1.

50. "Horrible Hydrophobia," *NYH*, 20 July 1871, 3; "A Child Dies from Hydrophobia," *NYTr*, 19 January 1886, 1; "Died in Awful Agony," *NYTr*, 13 December 1896, A8; "Boy Dies from Hydrophobia," *NYTr*, 28 August 1900, 7.

51. "Hydrophobia: Another Victim of the Terrible Malady," *BDE*, 24 April 1879, 4; "Death of the First Victim," *BDE*, 24 April 1879, 4.

52. "Hydrophobia: Another Victim of the Terrible Malady," *BDE*, 24 April 1879, 4.
53. "Dogs and Their Victims," *NYH*, 29 December 1885, 3.
54. "Savage Dogs in Brooklyn," *NYH*, 19 June 1895, 5. For other similar requests, see the following typical examples: "Hoboken," *NYH*, 8 July 1866, 5; "A Child's Terrible Death," *NYT*, 4 August 1878, 1; and "His Death Due to a Cat's Bite," *NYTr*, 14 May 1882, 12.
55. Letter to the Editor from "Lover of Truth," "Selections from the Mail—Hydrophobia or Lockjaw," *NYTr*, 20 June 1890, 7. The *Journal*, published out of Lewiston, Maine, also once suggested that the practice was supposed to "serve as a charm or an offering to some unknown demon that shall insure the safety of the person bitten." Reprinted in "Current Notes," *NYT*, 20 October 1886, 4.
56. [Untitled], *BDE*, 22 May 1868, 2.
57. "Board of Health," *NYH*, 8 June 1871, 8; "Hydrophobia," *BDE*, 8 March 1872, 4; "Curious Curatives," *BDE*, 26 December 1872, 1; "Bitten by a Savage Dog," *NYTr*, 14 June 1885, 1; "A Cure for Hydrophobia," *NYTr*, 5 August 1888, 5; "Fashionable Mutilation of Dogs," *NYT*, 31 March 1895, 5; Fleming, *Rabies and Hydrophobia*, 13–14 (on Pliny as classical source); Frazer, *The Golden Bough*, ch. 3 (on sympathetic magic and its late nineteenth-century European manifestations).
58. "Shocking Termination of a Marriage in France," *BDE*, 8 August 1855, 2.
59. "Shocking Termination of a Marriage in France," *BDE*, 8 August 1855, 2. A similar account of bridal carnage appeared again a generation later: "Europe Still Talking," *BDE*, 30 March 1890, 2. Versions of this story circulated at least as early as 1702: see Wasik and Murphy, *Rabid*, 77. Other studies have also reported variants of the tale: see John Douglas Blaisdell, "A Frightful, but Not Necessarily Fatal, Madness: Rabies in Eighteenth-Century England and English North America" (PhD diss., Iowa State University, 1995), 5, for an example from 1766, and Harriet Ritvo, *The Animal Estate: The English and Other Creatures in the Victorian Age* (Cambridge, MA: Harvard University Press, 1987), 173, for a version from 1800.
60. Consider, for example, John Putnam Demos's appeal to Freudian psychology and innate characteristics of the human psyche in his analysis of witchcraft narratives in Puritan New England versus Carlo Ginzburg's historicist reading of witchcraft beliefs and other myths, which emphasizes dispersion from common points of origin. Demos, *Entertaining Satan: Witchcraft and the Culture of Early New England* (New York: Oxford University Press, 1982), esp. ch. 6; Ginzburg, *Ecstasies*. Scholars of folklore have been dealing with the problem of structural versus historical explanation for at least a century: see, for example, Caroline Taylor Stewart, "The Origin of the Werewolf Superstition," *University of Missouri Studies* 2, Social Science Series (April 1909): 253–89, on 257–58.
61. More recent scholarship on animal-based discourses and belief systems emphasizes adaptation and cultural hybridity at work, rather than more static concepts of cultural "survivals," in which folk understandings either remain part of an unchanging edifice of tradition or perish. See A. James Arnold, ed., *Monsters, Tricksters, and Sacred Cows: Animal Tales and American Identities* (Charlottesville: University Press of Virginia, 1996), especially the introduction by Arnold and the essays by Gary H. Gossen and Kandioura Dramé.
62. S. K. Robisch, *Wolves and the Wolf Myth in American Literature* (Reno: Univer-

sity of Nevada Press, 2009), 207; see also Barry Lopez, *Of Wolves and Men* (New York: Scribner Classics, 2004; original edition published 1978), 269.

63. Wasik and Murphy, *Rabid*, ch. 3; Robisch, *Wolves and the Wolf Myth*, 109; W. M. S. Russell and Claire Russell, “The Social Biology of Werewolves,” in *Animals in Folklore*, ed. J. R. Porter and W. M. S. Russell (Cambridge: D. S. Brewer, 1978, and Totowa, NJ: Rowman and Littlefield, 1978), 143–82, on 162–63; H. Sidky, *Witchcraft, Lycanthropy, Drugs and Disease: An Anthropological Study of the European Witch-Hunts* (New York: Peter Lang Publishing, 1997), 242–45; Robert S. Bobrow, *The Witch in the Waiting Room: A Physician Investigates Paranormal Phenomena in Medicine* (New York: Thunder’s Mouth Press, 2006), 61; Stewart, “The Origin of the Werewolf Superstition,” 273–74.

64. Russell and Russell, “The Social Biology of Werewolves,” 155–56.

65. Quoted in Demos, *Entertaining Satan*, 106; see also 167 and 174. On witches’ attacks against livestock, see Demos, *Entertaining Satan*, 6, 140, 142, 171, 186, 239–40; on their suckling of animals, see 179–80. Demos notes cases in which human victims made animal noises on 101 and 135. In addition, John Douglas Blaisdell’s dissertation on the history of rabies documented the extent to which disease outbreaks in animals also prompted accusations of witchcraft in seventeenth-century New England. Blaisdell, “A Frightful, but Not Necessarily Fatal, Madness,” 74–76.

66. Quotations in Demos, *Entertaining Satan*, 45, 249, and 174, respectively.

67. Demos, *Entertaining Satan*, 390, 183.

68. Demos, *Entertaining Satan*, 218, 390.

69. David D. Hall, “A World of Wonders: The Mentality of the Supernatural in Seventeenth-Century New England,” in *Seventeenth-Century New England*, ed. David D. Hall and David Grayson Allen (Boston: Colonial Society of Massachusetts, 1984), 239–74. For a theoretical discussion on deriving cultural origins from morphological similarities between folk tales, see Ginzburg, *Ecstasies*.

70. For example, scholars have identified multiple forms of cultural transmission at work in the history of nineteenth-century medicine, including exchanges of knowledge and practices between peoples of European, African, and Native American descent: see Elliott J. Gorn, “Black Magic: Folk Beliefs of the Slave Community,” in *Science and Medicine in the Old South*, ed. Ronald L. Numbers and Todd L. Savitt (Baton Rouge: Louisiana State University Press, 1989), 295–326, on 303; Genovese, *Roll, Jordan, Roll*, 217–18, 224–28; and Virgil J. Vogel, *American Indian Medicine* (Norman: University of Oklahoma Press, 1970), chs. 3–4.

71. “Horrible Death by Hydrophobia,” *BDE*, 25 March 1848, 2; “Dreadful Case of Hydrophobia,” *BDE*, 1 June 1852, 2, reprinted from the *Oswego Journal*; “Hydrophobia—A Horrible Case,” *BDE*, 23 December 1863, 1; “Died of Hydrophobia,” *NYT*, 8 July 1888, 2; “Died of a Bite—An Unusually Violent Case of Hydrophobia,” *BDE*, 23 January 1891, 6. For cases of suicide, see “Another Case of Hydrophobia—Suicide by Drowning,” *BDE*, 5 July 1853, 2; “Suicide Rather Than Rabies,” *BDE*, 3 April 1896, 1; and “Suicide through Fear of Hydrophobia,” *NYTr*, 14 January 1900, 6.

72. Ezekiel J. Emanuel, “The History of Euthanasia Debates in the United States and Britain,” *Annals of Internal Medicine* 121 (15 November 1994): 793–802; Bruce W. Fye, “Active Euthanasia: An Historical Survey of Its Conceptual Origins and Introduction into Medical Thought,” *Bulletin of the History of Medicine* 52 (Winter 1978): 492–502.

73. “Lecture by John B. Gough,” *BDE*, 17 November 1860, 3; “Cure of Hydrophobia,” *BDE*, 24 July 1865, 1; “Bitten Children to Sail To-morrow,” *NYTr*, 8 December 1885, 5.

74. See, for example, “Dog Day Perils,” *NYH*, 19 July 1881, 8.

75. Blatchford, *Hydrophobia*, 51.

76. Homans, *A Case of Hydrophobia*, 5, 6.

77. Homans, *A Case of Hydrophobia*, 7.

78. “Horrors of Hydrophobia,” *NYH*, 3 February 1886, 5.

79. “Smothered to End His Misery,” *NYT*, 4 February 1886, 3; “News of the Day,” *NYT*, 7 March 1867, 4; “Current Events,” *BDE*, 25 April 1874, 4; “A Victim of Hydrophobia,” *NYT*, 15 November 1886, 1.

80. Emanuel, “The History of Euthanasia Debates,” 797–98, quotation on 797.

81. “Anesthetics: Their Uses Considered from a Medico-Legal Standpoint,” *BDE*, 25 December 1881, 3.

82. “Anesthetics: From the Cradle to the Grave,” *BDE*, 9 March 1882, 2; “Discussing Anesthetics Medically and Legally,” *BDE*, 9 March 1882, 2.

83. *New York Medical Journal*, text reproduced in “Murder as a Medical Agent,” *BDE*, 15 December 1886, 4.

84. “The Right to Kill,” *BDE*, 25 January 1897, 6.

85. “Hastened Son’s Death in Mercy, Says Doctor,” *NYTr*, 2 September 1912, 5.

86. For example, a 1996 survey of American physicians found that nearly 5 percent of respondents had administered at least one lethal injection in their careers upon request from patients or their family members, while more than 3 percent had prescribed medications to help patients end their lives. Diane E. Meier, Carol-Ann Emmons, Sylvan Wallenstein, Timothy Quill, R. Sean Morrison, and Christine K. Cassel, “A National Survey of Physician-Assisted Suicide and Euthanasia in the United States,” *New England Journal of Medicine* 338 (23 April 1998): 1193–1201.

87. Quoted in Ian Dowbiggin, *A Merciful End: The Euthanasia Movement in Modern America* (Oxford: Oxford University Press, 2003), 175. On the New York State Task Force’s conclusions, see also Milton J. Lewis, *Medicine and Care of the Dying: A Modern History* (Oxford: Oxford University Press, 2007), 226.

88. Drew Gilpin Faust, *This Republic of Suffering: Death and the American Civil War* (New York: Vintage Books, 2008), ch. 1, quotations from 22 and 27, respectively.

89. Mark S. Schantz, *Awaiting the Heavenly Country: The Civil War and America’s Culture of Death* (Ithaca, NY: Cornell University Press, 2008), 18–19.

90. Faust, *This Republic of Suffering*, 7; Dasia N. Posner, “Spectres on the New York Stage: The (Pepper’s) Ghost Craze of 1863,” in *Representations of Death in Nineteenth-Century US Writing and Culture*, ed. Lucy E. Frank (Aldershot: Ashgate Publishing, 2007), 190; Robert V. Wells, *Facing the “King of Terrors”: Death and Society in an American Community, 1750–1990* (Cambridge: Cambridge University Press, 2000), chs. 5 and 7; James J. Farrell, *Inventing the American Way of Death, 1830–1920* (Philadelphia: Temple University Press, 1980), ch. 3, esp. 82, 94–95.

91. Michel Foucault, *Madness and Civilization: A History of Insanity in the Age of Reason* (New York: Random House, 1965; originally published by Librarie Plon as *Historie de la Folie*, 1961), 72–78, quotation on 74.

92. [Untitled], *NYT*, 6 June 1854, 3.

93. “Jetsam from New Jersey,” *NYH*, 18 November 1885, 9; “Current Events,” *BDE*,

31 March 1886, 2; “Dying from Hydrophobia,” *NYTr*, 31 March 1886, 5. See also “Death from a Dog’s Bite,” *NYTr*, 19 January 1889, 10.

94. Wells, *Facing the “King of Terrors,”* 46; Posner, “Spectres on the New York Stage,” 190.

95. “Death from Hydrophobia,” *NYTr*, 27 December 1854, 3.

96. “Terrible Death of a Child by Hydrophobia,” *NYTr*, 31 July 1858, 6.

97. “Fatal Case of Hydrophobia,” *BDE*, 16 January 1860, 2, reprinted from the *Dayton Journal*.

98. “Hertline Mad: A Brooklyn Builder Stricken with Hydrophobia,” *BDE*, 13 May 1886, 4; see also “The Case of Jacob Hertline,” *BDE*, 14 May 1886, 1, and “Dying from Hydrophobia,” *NYTr*, 14 May 1886, 8.

99. “Hertlin [sic] Dead,” *BDE*, 14 May 1886, 6 (for the quotation); “Death from a Dog Bite,” *NYTr*, 15 May 1886, 8.

100. “Hydrophobia’s Terrors—How a Victim, Foreseeing His Death, Made Preparation,” *BDE*, 17 November 1889, 14, reprinted from the *Indianapolis News*.

Chapter 3 • Remedies and Materia Medica

1. [Untitled], *NYTr*, 25 June 1872, 4.

2. H. C. Wood Jr., *A Treatise on Therapeutics, Comprising Materia Medica and Toxicology* (Philadelphia: J. B. Lippincott and Company, 1874), 102 (on nitrate of ammonia), 172 (castor), 381 (castor oil), 246–53 (chloroform), 194–95 (morphia), and 424 (juniper). On the diuretic properties of nitrate of ammonia, see Jonathan Pereira, *The Elements of Materia Medica and Therapeutics*, 2nd ed., vol. I (London: Longman, Brown, Green, and Longmans, 1842), 326. J. W. Comfort, *The Practice of Medicine on Thomsonian Principles*, 6th ed. (Philadelphia: Lindsay and Blakeston, 1859), 548 provides a Thomsonian perspective on oil of juniper. The use of onions as a folk remedy is discussed in Gabrielle Hatfield, *Encyclopedia of Folk Medicine: Old World and New World Traditions* (Santa Barbara, CA: ABC-CLIO, 2004), 255–56. An ancient Greek source also recommended ingestion of onions and pepper, in conjunction with heavy bleeding, for the treatment of animal poisons, including rabies. J. L. Conte, “Garlic and Rabies—A Historical Review,” *MR* 27 (28 February 1885): 236–37, on 237. Vapor baths and madstones are addressed in detail later in the present chapter.

3. John Harley Warner, *The Therapeutic Perspective: Medical Practice, Knowledge, and Identity in America, 1820–1885* (Cambridge, MA: Harvard University Press, 1986), 4.

4. Conevery Bolton Valenčius, *The Health of the Country: How American Settlers Understood Themselves and Their Land* (New York: Basic Books, 2002), 55–57.

5. Warner, *The Therapeutic Perspective*, ch. 3 (quotation on 62); Valenčius, *The Health of the Country*.

6. Lewis Feuchtwanger, *Mad Dogs: Or Hydrophobia, with all its Various Symptoms, Causes, and Remedies, Minutely Described* (New York: Wm. Applegate, 1840), 13.

7. Warner, *The Therapeutic Perspective*, 85–91.

8. Thomas W. Blatchford, *Hydrophobia: Its Origins and Development, as Influenced by Climate, Season, and Other Circumstances. Being the Report of the Special Committee Appointed by the American Medical Association, and Read at the Meeting in Detroit, MI, May, 1856* (Philadelphia: T. K. and P. G. Collins, 1856), 8–9; emphasis original.

9. Charles P. Russel, “Hydrophobia in Dogs and Other Animals, and the Sanitary

Precautions against Its Transmission to the Human Race,” in New York City Department of Health, *Fifth and Sixth Annual Reports of the Board of Health of the Health Department of the City of New York, May 1, 1874, to December 31, 1875* (New York: Martin B. Brown, 1876), 735.

10. Blatchford, *Hydrophobia: Its Origins and Development*, 7–11, quotations on 9–11; emphasis original.

11. On Smith’s background, consult Russell Viner, “Abraham Jacobi and the Origin of Scientific Pediatrics in America,” in *Formative Years: Children’s Health in the United States, 1880–2000*, ed. Alexandra Minna Stern and Howard Markel (Ann Arbor: University of Michigan Press, 2002), 23–46, on 36–39.

12. J. Lewis Smith, *Report of a Case of Hydrophobia; with Statistical Observations* (New York: Holman and Gray, 1856), 14–15 (for the quotations), 33–35, 43–44.

13. George Fleming, *Rabies and Hydrophobia: Their History, Nature, Causes, Symptoms, and Prevention* (London: Chapman and Hall, 1872), 344; Russel, “Hydrophobia in Dogs and Other Animals,” 747.

14. Fleming, *Rabies and Hydrophobia*, 87, 90–92, 122.

15. William A. Hammond, *A Treatise on Diseases of the Nervous System* (New York: D. Appleton and Company, 1871), 551–52; Russel, “Hydrophobia in Dogs and Other Animals,” 727, 735. For debates over disease specificity in rabies, see, for example, Charles W. Dulles, “Criticisms of the Specific Theory of Hydrophobia,” *NYMJ* 38 (29 December 1883): 707–11; Hermann M. Biggs, “The Aetiology of Rabies and the Method of M. Pasteur for Its Prevention,” *NYMJ* 43 (27 March 1886): 342–49; and Charles L. Dana, “The Reality of Rabies,” *MR* 39 (3 January 1891): 3–6. On the reception of germ theory among American physicians, consult Nancy Tomes, *The Gospel of Germs: Men, Women, and the Microbe in American Life* (Cambridge, MA: Harvard University Press, 1998), 26–34; and Tomes, “American Attitudes toward the Germ Theory of Disease: Phyllis Allen Richmond Revisited,” *Journal of the History of Medicine and Allied Sciences* 52 (January 1997): 17–50.

16. See “Hydrophobia, or Canine Madness,” *NYTr*, 24 August 1841, 4; “City Items,” *NYTr*, 15 November 1848, 2; “Hydrophobia Easily Cured,” *BDE*, 8 July 1866, 6; *NYTr*, 31 August 1876, 4; and “Lessons in First Aid to the Injured,” *NYTr*, 8 February 1884, 3, among numerous other examples. During a hydrophobia outbreak in 1874, the New York Department of Health also released an information card that recommended cauterization with silver nitrate to destroy the virus of hydrophobia. *Fifth and Sixth Annual Reports of the Board of Health*, 151. On Celsus’s recommendations, see James H. Steele, “History of Rabies,” in *The Natural History of Rabies*, vol. 1, ed. George M. Baer (New York: Academic Press, 1975), 2.

17. In the mid-1850s, J. Lewis Smith pointed to hospitals in Sweden and Switzerland that touted nearly complete success rates in preventing hydrophobia through cauterization or related procedures going back as far as the late eighteenth century, although he cautioned that these claims assumed all of the patients were bitten by animals that were actually rabid. By the 1870s, official statistics tried to distinguish more carefully between persons definitely bitten by mad dogs and those who merely sought precautionary treatment for a generic animal bite. Success rates dropped off, but still remained significant. Smith, “Analysis of Doubtful and Spurious Cases of Hydrophobia,” *NYJM* 16 (new series) (May 1856): 317–33, on 324–25. Henri Bouley,

whose extended lecture on hydrophobia circulated readily in translation among American physicians, cited French public health data in which the mortality rate for 66 bite victims with noncauterized wounds was 84 percent, as compared to 31 percent for the 134 recipients of bites from mad animals who had their sites of injury cauterized. Bouley, *Hydrophobia*, 44.

18. “The Effect of Cauterization or Cleansing of Wounds Infected with Rabies, after an Interval of Twenty-four Hours,” *MR* 55 (21 January 1899): 107–8.

19. L. L. Dorr, “Rabies—A Possible Cause and a Probable Preventive,” *NYMJ* 34 (November 1881): 470–76, on 470.

20. Dr. Stephen C. Griggs of Providence, Rhode Island, quoted in Blatchford, *Hydrophobia*, 62; emphasis original.

21. William Buchan, *Domestic Medicine: A Treatise on the Prevention and Cure of Diseases . . . Revised, Enlarged, and Adapted to the Diseases of the United States . . . by J. G. Norwood, M.D.* (Cincinnati: U. P. James, 1838), 456, 459; Fleming, *Rabies and Hydrophobia*, 315–17, 320; Bigelow, *Hydrophobia*, 93–94.

22. See, for example, “Hydrophobia—Is It Curable?” *BDE*, 2 May 1863, 2; “The Supposed Case of Hydrophobia—Statement of Dr. Firth,” *BDE*, 9 May 1863, 2.

23. Paul Starr, *The Social Transformation of American Medicine* (New York: Basic Books, 1982), 44–58; John Harley Warner, “The Fall and Rise of Professional Mystery: Epistemology, Authority and the Emergence of Laboratory Medicine in Nineteenth-Century America,” in *The Laboratory Revolution in Medicine*, ed. Andrew Cunningham and Perry Williams (Cambridge: Cambridge University Press, 1992), 110–41, on 113–15.

24. Warner, *The Therapeutic Perspective*, ch. 3.

25. Warner, *The Therapeutic Perspective*, 28–30, 91–98.

26. Buchan, *Domestic Medicine* (Norwood ed.), 13–96 (on the virtues of diet, exercise, and other appropriate habits) and 657–72 (on materia medica, especially from botanical sources); [John C. Gunn], *Gunn’s Domestic Medicine, or Poor Man’s Friend, in the Hours of Affliction, Pain and Sickness*, 4th ed. (Springfield, OH: John M. Gallagher, 1835), 142–77 (on the role of sleep, exercise, baths, and food in the maintenance of health) and 510–85 (on plant materia medica). On the history of Buchan’s domestic medical guide and its many editions, see Charles E. Rosenberg, “Medical Text and Social Context: Explaining William Buchan’s *Domestic Medicine*,” *Bulletin of the History of Medicine* 57 (Spring 1983): 22–42. For historical context on *Gunn’s Domestic Medicine*, see Charles E. Rosenberg, “Introduction to the New Edition,” in *Gunn’s Domestic Medicine: A Facsimile of the First Edition* (Knoxville: University of Tennessee Press, 1986).

27. Warner, *The Therapeutic Perspective*, 60 (on the formula-driven therapeutics of homeopaths and Eclectics) and 179 (on regulars’ acknowledgment of sectarians’ contributions). On rare occasions, homeopaths pioneered the use of new drugs that later entered the regular physicians’ medical arsenal, as in the case of nitroglycerin: W. Bruce Fye, “Vasodilator Therapy for Angina Pectoris: The Intersection of Homeopathy and Scientific Medicine,” *Journal of the History of Medicine and Allied Sciences* 45 (July 1990): 317–40.

28. Buchan, *Domestic Medicine* (Norwood ed.), xi.

29. Buchan, *Domestic Medicine* (Norwood ed.), 674.

30. *Gunn’s Domestic Medicine*, 4th ed., 131–40, quotation on 131; emphasis original.

31. Buchan, *Domestic Medicine* (Norwood ed.), iv. See also *Gunn's Domestic Medicine*, 4th ed., 638.

32. Starr, *The Social Transformation of American Medicine*, 31–34.

33. “Cure for Hydrophobia,” *NYTr*, 16 June 1853, 3; Letter to the Editor from “Philanthropy,” “Mad Dogs,” *NYTr*, 29 June 1854, 5; [untitled], *BDE*, 6 April 1867, 1, and Letter to the Editor from “Philo,” “A Remedy Remembered,” *BDE*, 22 June 1874, 2; “Stray Notes,” *NYTr*, 21 July 1868, 3; Letter to the Editor from “Terpentine,” “A Cure for Hydrophobia,” *BDE*, 12 August 1881, 4; “Roses,” *BDE*, 6 April 1884, 9; “A Plant of Renown,” *BDE*, 3 September 1889, 3; Letter to the Editor from “A Woman,” “A Woman’s Remedy for Dog Bites,” *NYTr*, 30 June 1890, 7; “‘Uncle Simon’s’ Rabies Cure,” *NYT*, 25 March 1903, 6.

34. “Russian Cure for Hydrophobia,” *NYTr*, 23 September 1857, 6; “A Cure for Hydrophobia,” *NYT*, 31 October 1872, 3; “A Secret Rival of Pasteur,” *NYTr*, 6 March 1887, 10 (reprinted from the *Pall Mall Gazette*; abridged version also reported in “A Dutch Cure for Hydrophobia,” *NYT*, 6 March 1887, 6).

35. “Quacks in the Middle Ages,” *BDE*, 23 March 1887, 2. In 1874, for example, a writer in Middleport, New York, informed the mayor of NYC that he would “take good notes for pay, payable in six months if cure is perfected,” in exchange for administering his near-perfect rabies cure. “A Doctor on Hydrophobia—Philanthropy and Business,” *BDE*, 16 July 1874, 4.

36. Letter to the Editor from “G. W. B.,” “Cure for Hydrophobia,” *NYTr*, 7 August 1868, 2; “Municipal—Precautions against Hydrophobia,” *BDE*, 29 April 1879, 4; “‘Brick-dust’ Cure Fails for Once,” *NYTr*, 14 December 1906, 10.

37. Letter to the Editor from “Franklin,” “Mad Dogs—Dog-Killing—Hydrophobia,” *NYTr*, 21 August 1846, 2; Letter to the Editor from “Franklin,” “Hydrophobia—A Certain Remedy,” *NYTr*, 9 September 1846, 2; William A. Purrington, “Manslaughter, Christian Science, and the Law,” *MR* 54 (26 November 1898): 757–61, on 757.

38. Letter to the Editor from S. Rutman, New Jersey, “Madness and Its Remedies,” *NYTr*, 19 June 1844, 1. All three cures appeared in the 1785 edition of Wesley’s treatise: John Wesley, *Primitive Physick: Or, an Easy and Natural Method of Curing Most Diseases*, 21st ed. (London, 1785), 78.

39. Starr, *The Social Transformation of American Medicine*, 47, 453n33 notes the two-way relationship between folk knowledge and physicians’ therapeutic regimens. Londa Schiebinger, *Plants and Empire: Colonial Bioprospecting in the Atlantic World* (Cambridge, MA: Harvard University Press, 2004), ch. 2 addresses eighteenth-century English physicians’ reliance on local sources of knowledge at home and indigenous sources in the colonies. *Gunn’s Domestic Medicine*, as part of an economic nationalism that stressed the advantages of domestic materia medica, frequently mentioned indigenous knowledge as the original source for the medical uses of plants native to the United States and its territories. *Gunn’s Domestic Medicine*, 4th ed., 510–85. Charles E. Rosenberg has also highlighted Gunn’s mixture of vernacular and physicians’ medical knowledge: Rosenberg, “Introduction to the New Edition,” xv (including note 14) and xix.

40. “Bite of Mad Dogs,” *NYT*, 19 March 1853, 3; “Remedy for the Bite of a Mad Dog,” *BDE*, 28 May 1855, 2; “Miscellaneous News,” *BDE*, 23 June 1865, 1; “A Saxon Doctor’s Prescription,” *NYH*, 30 June 1874, 5. Multiple other remedies crossed from folk usages

into the medical literature. In 1885, for example, an indignant American physician wrote to the *Medical Record* to point out that the preventive properties of garlic credited by a London publication as a recent discovery by a French physician actually dated back to the ancient Greeks. Conte, “Garlic and Rabies—A Historical Review,” 236. Another herbal hydrophobia cure mentioned in multiple news reports during the mid-nineteenth century, elecampane root, had by that point disappeared from the American materia medica of regular physicians, but was commonly invoked in English sources a century earlier and likely reflected popular healing traditions based on readily available roots, herbs, and other materials. For news stories about elecampane, see “Cure for Hydrophobia,” *NYTr*, 23 May 1857, 5; Letter to the Editor from “A. Y.,” “Hydrophobia—How to Cure It,” *NYH*, 23 March 1872, 9; “General Notes,” *NYTr*, 13 November 1875, 4; “Alleged Cure for Hydrophobia,” *NYTr*, 23 February 1878, 6; and “Hydrophobia,” *BDE*, 25 May 1879, 2. Jonathan Pereira, *The Elements of Materia Medica and Therapeutics*, 3rd American ed., ed. Joseph Carson, vol. II (Philadelphia: Blanchard and Lea, 1854), 590 noted that elecampane “is rarely employed now by the medical practitioner.” By the 1860s and 1870s, it no longer merited mention in the materia medica: note the absence of discussion in Alfred Stillé, *Therapeutics and Materia Medica: A Systematic Treatise on the Action and Uses of Medicinal Agents, Including Their Description and History*, 2 vols. (Philadelphia: Blanchard and Lea, 1860), and in Wood, *A Treatise on Therapeutics*. J. W. Comfort’s Thomsonian treatise dismissed elecampane’s effectiveness for hydrophobia but acknowledged its stimulant and general strengthening effects for other conditions. Comfort, *The Practice of Medicine on Thomsonian Principles*, 6th ed., 291, 389, 557, 562. For an earlier, eighteenth-century appraisal of elecampane’s uses, see John Hill, *A History of the Materia Medica* (London, 1751), 617–20.

41. Advertisement for an “Anti-Spasmodic Tincture,” *BDE*, 15 June 1846, 2 (the ad ran almost daily between this date and 8 September 1846); “Singular Case of Hydrophobia,” *NYTr*, 20 June 1859, 3 (reprinted from the *Cincinnati Enquirer*); Letter to the Editor from Louis Hoffman, “Views of Correspondents,” *BDE*, 19 August 1867, 2; advertisement, “Hydrophobia Can Be Cured,” *NYH*, 20 June 1874, 7; “Hydrophobia,” *BDE*, 21 May 1886, 2; “Miscellaneous Items,” *BDE*, 31 October 1870, 1.

42. Warner, *The Therapeutic Perspective*, 91–100. Samuel B. Thielman’s account of antebellum treatments for insanity also documents the turn away from depletive therapies: Thielman, “Madness and Medicine: Trends in American Medical Therapeutics for Insanity, 1820–1860,” *Bulletin of the History of Medicine* 61 (Spring 1987): 25–46.

43. Thomas Turner, “Report of a Case of Hydrophobia, with Post-mortem Appearances,” *NYJM*, 15 (November 1855): 353–56, on 354; “News of the Week,” *MR* 30 (2 October 1886): 381.

44. Feuchtwanger, *Mad Dogs: Or Hydrophobia*, 11.

45. Smith, *Report of a Case of Hydrophobia*, 60; Warner, *The Therapeutic Perspective*, 144 (on brandy and beef tea).

46. Gunn’s *Domestic Medicine*, 4th ed., 619–20, quotation on 619. Buchan’s *Domestic Medicine* similarly advised, “Let it be remembered, then, that the remedies which are reputed anodynes are stimulants.” Buchan, *Domestic Medicine* (Norwood ed.), 657. On the origins of opium and laudanum, see Miles Weatherall, “Drug Treatment and the Rise of Pharmacology,” in *The Cambridge History of Medicine*, ed. Roy Porter (Cam-

bridge: Cambridge University Press, 2006), 211–37, on 212–13, and John Mann, *Murder, Magic, and Medicine*, rev. ed. (Oxford: Oxford University Press, 2000), 190–92.

47. For cases at New York Hospital, see “Rabies Canina (Dr. Griscom),” 14 May [1855], from Patient Medical Records, [Case Book], Medical Division, New York Hospital, vol. 22, pp. 51–55, Medical Center Archives, Cornell University Weill Medical College, New York, NY; and MS54, Thaddeus Mills Halsted, “Case of Hydrophobia Occurring in the New York Hospital, December 15, 1856 . . . Read by Dr. Halsted at a Meeting of the New York Medical and Surgical Society on January 15, 1857,” handwritten document, New York Academy of Medicine Library, New York, NY. In accordance with the regulations of the Weill Medical School, I have not identified Griscom’s patient, even though he was named in contemporaneous press coverage of the case. Charles D. Homans used laudanum, along with brandy, at various points in the case of possible euthanasia discussed in chapter 2. In response to readers’ potential criticisms, Homans noted, “It may be asked why stimulants were not given in greater quantity, or why no other medicines than those mentioned above were administered?” Note the wording here: Homans clearly understood the combination of brandy and laudanum as stimulative, although he employed them in proportions less heroic than some readers might expect, because the efforts at treatment caused such severe paroxysms “that it seemed absolutely cruel to persist in forcing him to swallow a quantity of articles, in favor of which no argument could be brought forward other than an empirical one.” Homans, “A Case of Hydrophobia,” read before the Boston Society for Medical Observation, 6 March 1854, copy in the New York Academy of Medicine Library, New York, NY, 4–7, quotation on 7.

Medical practitioners rarely claimed more than mitigation of symptoms through the use of opium, but New York readers occasionally encountered curative claims, such as the 1842 report that heralded opium-soaked French cigars as a quick fix for hydrophobia, tetanus, and similar conditions, a treatment that combined the sedating and stimulating qualities of opium with the tonic properties of tobacco. “Tic Doloureux,” *NYTr*, 20 September 1842, 2; “Tic Doloureux,” *BDE*, 26 September 1842, 2; Gunn’s *Domestic Medicine*, 4th ed., 529.

48. Henry Guernsey, *Hydrophobia: A Case, with Remarks* (New York, reprinted from the *American Medical Gazette*, December 1856), 3–4, copy in the New York Academy of Medicine Library, New York, NY.

49. Gunn’s *Domestic Medicine*, 4th ed., 134; Buchan, *Domestic Medicine* (Norwood ed.), 657–72, esp. 661, 664. As Charles E. Rosenberg has noted, despite this vaunted medical nationalism, mercury, ipecac, and opium remained the foremost drugs in physicians’ arsenal during Gunn’s time, and all were imported. Rosenberg, “Introduction to the New Edition,” xix.

50. Gunn’s *Domestic Medicine*, 4th ed., 529 (on tobacco); Buchan, *Domestic Medicine* (Norwood ed.), 657; and Gunn’s *Domestic Medicine*, 4th ed., 521 (on Jamestown weed). Gunn also noted American Indians’ medicinal use of both plants, in a nod to indigenous peoples’ knowledge and contributions to regular physicians’ armamentarium.

51. Consider also the history of ipecacuanha, another entry in the global *materia medica* with therapeutic potential for hydrophobia. In 1848, the *Brooklyn Daily Eagle* recorded a Pennsylvania physician’s belief that his 12-year-old patient had recovered from hydrophobia, thanks to a treatment plan that included regular doses of Dover’s

powder, a mixture of opium and ipecacuanha popularized by the eighteenth-century privateer and physician Thomas Dover and still in wide usage throughout the nineteenth century. Ipecacuanha originated in Central and South America, spread to European hospitals by the eighteenth century as part of the admixture of plants and empire, and also dominated mid-nineteenth-century American medical practice as a powerful emetic. “Hydrophobia Successfully Treated,” *BDE*, 18 October 1848, 2; Weatherall, “Drug Treatment and the Rise of Pharmacology,” 216–17; Schiebinger, *Plants and Empire*, 6, 73, 165, 178; Rosenberg, “Introduction to the New Edition,” xi, xix.

52. Mann, *Murder, Magic, and Medicine*, 196 (for general background); Warner, *The Therapeutic Perspective*, 117, 119, 138 (on rates of morphine use at two American hospitals in the 1830s, 1840s, and beyond); Jonathan Lewy, “The Army Disease: Drug Addiction and the Civil War,” *War in History* 21 (January 2014): 102–19, on 103–5 (on Civil War–era battlefield usage). Sources generally credit the German pharmacist Friedrich Sertürner with the first chemical isolation of morphine in 1806, but Mann suggests that the priority claim might rest with Armand Séquin in 1804 (*Murder, Magic, and Medicine*, 196).

53. “Hydrophobia,” *MR* 1 (15 January 1867): 532; Wm. T. Plant, “Cases of Hydrophobia,” *MR* 3 (1 June 1868): 171–72; J. W. Pinkham, “A Case of Hydrophobia,” *MR* 3 (15 August 1868): 292–93; John G. Janeway, “On Hydrophobia,” *MR* 10 (6 March 1875): 177–80, on 178; M. Storrs, “An Interesting Case of Hydrophobia and a Question of Diagnosis,” *MR* 12 (30 June 1877): 418–21, on 419; C. C. Goddard, “Hydrophobia,” *MR* 16 (9 August 1879): 152–54, on 153.

54. Mann, *Murder, Magic, and Medicine*, 27; Fye, “Vasodilator Therapy for Angina Pectoris,” 335.

55. Erwin H. Ackerknecht, *Therapeutics: From the Primitives to the 20th Century* (New York: Hafner Press, 1973), 85; “An Alleged Cure of Hydrophobia,” *MR* 27 (4 April 1885): 384; “Facts and Hints,” *BDE*, 2 January 1887, 7.

56. James Thacher, *The American New Dispensatory* (Boston, 1810), 264–65; Gunn’s *Domestic Medicine*, 4th ed., 267, 317, 373, 423, 460, 473, 475, 620, 639, 730; Buchan, *Domestic Medicine* (Norwood ed.), 243, 350, 354, 415, 420, 435, 453.

57. “Hydrophobia,” *BDE*, 19 August 1846, 2. See also Letter to the Editor from “Hartshorn?” *NYH*, 10 August 1846, 2.

58. In the 1750s, the British chemist Robert Dossie emphasized that a true, high-quality product had to use real hartshorn and not cheap substitutes. Dossie, *The Laboratory Laid Open, or, the Secrets of Modern Chemistry and Pharmacy Revealed* (London, 1758), 86. In the early decades of the nineteenth century, dispensaries and medical texts began to identify spirit of hartshorn with solutions of ammonia or ammonia compounds, although they disagreed over its exact relationship to aqua ammoniae. Thacher, *The American New Dispensatory*, 264; Gunn’s *Domestic Medicine*, 4th ed., 726; Robert Christison, *A Dispensatory, or Commentary on the Pharmacopoeias of Great Britain* (Edinburgh, 1842), 104. Late nineteenth- and early twentieth-century texts, however, considered spirit of hartshorn and aqueous ammonia to be the same thing. Charles D. F. Phillips, *Materia Medica and Therapeutics*, American ed., vol. I (New York: William Wood and Company, 1882), 250; *Squibb’s Materia Medica* (New York: E. R. Squibb and Sons, 1906), 229.

59. George B. Wood, *The Dispensatory of the United States of America* (Philadelphia: Grigg, Elliot, and Company, 1849), 82.

60. Letter to the Editor from John Jamieson, “Hydrophobia and Venomous Bites,” *NYTr*, 5 March 1869, 10; Paluel de Marmon, “A New Treatment for the Prevention of Hydrophobia after Inoculation,” *MR* 8 (1 September 1873), 452–53; Letter to the Editor from E. Stanley Baxter of London, England, “Hydrophobia,” *NYT*, 25 April 1874, 5; “Notes from Washington,” *NYT*, 17 December 1885, 6.

61. “Notes from Washington,” *NYT*, 17 December 1885, 6; “Hydrophobia,” *BDE*, 19 August 1846, 2.

62. Alfred Stillé, *Therapeutics and Materia Medica*, 3rd ed., vol. II (Philadelphia: Henry C. Lea, 1868), 127.

63. For cases of palliation with chloroform, see H. Hartshorne, “Case of Hydrophobia Treated with Chloroform,” *NYJM* 2 (January 1849): 101; A. H. Brown, “Case of Hydrophobia Treated by Chloroform,” *NYJM* 2 (March 1849): 260; and “Hydrophobia,” *NYJM* 2 (May 1857): 351–52. In 1849, a physician thought chloroform had cured a hydrophobia case in Camden, New Jersey. “Case of Supposed Hydrophobia,” *NYJM* 2 (March 1849): 261. New York newspapers also published accounts of the case: “The Hydrophobia Case at Camden,” *NYTr*, 21 November 1848, 4; [untitled], *BDE*, 22 November 1848, 2. For additional reports of purported hydrophobia cures through chloroform, see “Chloroform [*sic*] and Hydrophobia,” *NYH*, 1 November 1848, 3; “European Items,” *BDE*, 26 January 1855, 2; and “Curing Hydrophobia with Chloroform,” *NYTr*, 18 July 1887, 5. Homans’s patient is discussed in ch. 2, pp. 72–73.

64. Warner, *The Therapeutic Perspective*, 100–102.

65. Case narratives and other reports involving significant use of chloral hydrate and potassium bromide include the following: “Two Cases of Hydrophobia treated by Hydrate of Chloral,” *NYMJ* 14 (October 1871): 416–17; William W. Hewlett, “Case of Hydrophobia,” *MR* 10 (27 March 1875): 235–36; Oswald Warner, “Report of a Case of Hydrophobia,” *MR* 12 (8 December 1877): 789–91, on 790; “A Case of Imaginary Hydrophobia,” *MR* 30 (9 October 1886): 404; M. W. Kelliher, “A Case of Rabies,” *MR* 39 (2 May 1891): 521; James Douglas, “History of a Case of Hydrophobia,” *NYMJ* 67 (17 December 1898): 51–54, on 52.

66. Fye, “Vasodilator Therapy for Angina Pectoris,” 317–40, on 327; Fye, “T. Lauder Brunton and Amyl Nitrite: A Victorian Vasodilator,” *Circulation* 74 (August 1986): 222–29, on 223; “Current Events,” *BDE*, 18 February 1875, 2; [untitled], *NYT*, 21 January 1883, 6.

67. George S. Davis, *The Pharmacology of the Newer Materia Medica* (Detroit, MI: George S. Davis, 1889), 807–29, esp. 807–8, 828; *Year-Book of Pharmacy* (London: J. and A. Churchill, 1874), 100–102; Friedrich A. Flückiger and Daniel Hanbury, *Pharmacographia: A History of the Principal Drugs of Vegetable Origin, Met with in Great Britain and British India*, 2nd ed. (London: Macmillan, 1879), 113–14.

68. Roberts Bartholow, “Cartwright Lectures, on the Physiological Antagonism between Medicines, and between Remedies and Diseases,” *MR* 19 (1 January 1881): 1–4, on 3; “Scientific Gossip,” *NYT*, 17 January 1882, 7; “The News from Europe,” *NYH*, 18 June 1882, 16; “Two Cures of Rabies Announced,” *MR* 22 (29 July 1882): 127–28; “Recovery of Nine Cases of Hydrophobia,” *MR* 22 (21 October 1882): 462 (on the

negative findings by the Paris Academy of Medicine); “A New Hydrophobia Cure,” *BDE*, 4 April 1886, 1; “Went into Convulsions at Sight of Water,” *NYH*, 22 February 1892, 9; Davis, *The Pharmacology of the Newer Materia Medica*, 828; “Pilocarpine as a Remedy for Rabies,” *NYMJ* 55 (2 January 1892): 17; “Is Lethargic Encephalitis a Form of Rabies?” *MR* 98 (9 October 1920): 608.

69. Alfred Stillé, *Therapeutics and Materia Medica*, 3rd ed., vol. I (Philadelphia: Henry C. Lea, 1868), 814; Mann, *Murder, Magic, and Medicine*, 83.

70. W. B. O’Shaughnessy, “On the Preparations of the Indian Hemp, or Gunjah,” *Provincial Medical Journal* 5 (4 February 1843): 363–69, on 364–65. The *NYJM* published an extensive summary of O’Shaughnessy’s account and lauded “his indefatigable researches”: *NYJM* 1 (November 1843): 390–98, quotation on 398.

71. *The Pharmacopeia of the United States of America* (Philadelphia: Lippincott, Grambo, and Company, 1851), 285; Letter to the Editor from J. W. Palmer, “Hasheesh in Hydrophobia,” *NYTr*, 30 May 1855, 7; Letter to the Editor from “A True Friend,” “Specific for Hydrophobia,” *NYT*, 29 August 1857, 3. In his extensive review of the case literature, J. Lewis Smith also noted the record of one patient who “had been taking Indian hemp in large doses,” and as a result, “his delirium was such as the cannabis is known to produce.” Smith, “Analysis of One Hundred and Thirty-One Cases of Hydrophobia,” *NYJM* 16 (January 1856): 48–62, on 54, 55.

72. “Hydrophobia: Its Successful Treatment, and Various Views as to Prophylaxis and Treatment,” *MR* 21 (18 February 1882): 179; see also “General Notes,” *NYTr*, 8 December 1881, 4, and “Scientific Gossip,” *NYT*, 18 December 1881, 4.

73. E. C. Lesserteur, *Le Hoàng-nàn: Remède Tonquinois contre la Rage, la Lèpre et autres Maladies* (Paris: Librairie J.-B. Ballière et Fils, 1879), v–vi, 15–89. Émile-Charles Lesserteur was the director of the Paris Seminary of Foreign Missions, and he enshrined the European discovery of hoàng-nàn within the history of Vietnamese resistance to the growing assertion of French power in Vietnam. According to Lesserteur, Gauthier sent the rabies remedy to France as an expression of gratitude for aid from European Catholics following the attacks on the French mission in Tonkin during an attempted overthrow of Emperor Tự Đức at the beginning of 1874. Lesserteur depicted the supposed revolutionaries as religious zealots and seditionists who lacked a legitimate political cause. In reality, the violence was anticolonial in nature and aimed at the recent French seizure of Hanoi, not Tự Đức’s rule, although it also embodied the erosion over the longer term of respect for the Nguyễn dynasty’s authority because of its inability to contain French imperialism. David Marr, *Vietnamese Anticolonialism, 1885–1925* (Berkeley: University of California Press, 1975), 40–41; Pierre Brocheux and Daniel Hémery, *Indochina: An Ambiguous Colonization, 1858–1954*, trans. Ly Lan Dill-Klein et al. (Berkeley: University of California Press, 2009), 28–29; Mark W. McLeod, *The Vietnamese Response to French Intervention, 1862–1874* (New York: Praeger Publishers, 1991), ch. 7.

74. Lesserteur, *Le Hoàng-nàn*, 9–11.

75. “New York Academy of Medicine,” *MR* 19 (19 February 1881): 212–15; “Hoàng-nàn Once More,” *MR* 19 (25 June 1881): 724.

76. “A New Remedy for Hydrophobia and Leprosy,” *MR* 17 (22 May 1880): 582; “Treatment of Rabies by Hoang-nan,” *MR* 21 (6 May 1882): 515; “A Rival to Pasteur,” *MR* 29 (24 April 1886): 479.

77. A. R. McIntyre, *Curare: Its History, Nature, and Clinical Use* (Chicago: University of Chicago Press, 1947), chs. 2 and 3; K. Bryn Thomas, *Curare: Its History and Usage* (London: Pitman Medical Publishing Company, 1964), chs. 2 and 3; Julia Blackburn, *Charles Waterton 1782–1865: Traveller and Conservationist* (London: Bodley Head, 1989), ch. 7.

78. Thomas, *Curare: Its History and Usage*, 44, 54, 61–64; McIntyre, *Curare: Its History, Nature, and Clinical Use*, 57–82, 91–92.

79. McIntyre, *Curare: Its History, Nature, and Clinical Use*, 183–84, 187; Thomas, *Curare: Its History and Usage*, 85–93; Blackburn, *Charles Waterton*, 66–69; L. A. Sayre, “Two Cases of Traumatic Tetanus,” *NYJM* 4 (March 1858): 250–53, on 252–53.

80. “Rabies Successfully Treated by Woorara,” *MR* 11 (11 March 1876): 188.

81. Roberts Bartholow, “Cartwright Lectures, on the Physiological Antagonism between Medicines, and between Remedies and Diseases,” Lecture V, *MR* 18 (18 December 1880): 673–76, on 673.

82. “Hydrophobia,” *NYH*, 8 April 1876, 10; “A Terrible Ordeal,” *NYH*, 22 April 1876, 4; “Death from Hydrophobia,” *NYH*, 11 July 1881, 6; “Current Events,” *BDE*, 11 August 1881, 2; “Terrible Death from Hydrophobia,” *NYTr*, 20 June 1885, 1; “Hydrophobia Developed in Newark,” *BDE*, 31 March 1886, 2; “In Fearful Paroxysms,” *NYH*, 16 November 1887, 3 (for the quotation); “Doctors Call It Hydrophobia,” *NYTr*, 30 November 1887, 1. The hospital case record for the patient treated with curare in 1881 is also available: [Patient records], “Medical #6 7/1881–10/1881” [noted on a catalog card; the spine of the original bound volume no longer exists], 9 August 1881, 93–98, Medical Archives, Cornell University Weill Medical School, New York, NY. In accordance with present-day hospital regulations, I have not identified the patient by name.

83. “Indian Poison Blamed for Club Dinner Deaths,” *NYTr*, 1 September 1919, 14.

84. Thomas R. Forbes, “The Madstone,” in *American Folk Medicine: A Symposium*, ed. Wayland D. Hand (Berkeley: University of California Press, 1976), 11–19, on 11–15.

85. “Hydrophobia—Remarkable Cure by Applying the ‘Mad Stone,’” *BDE*, 17 November 1865, 2; Letter to the Editor (writer unnamed), “The Fauquier Mad-Stone,” *NYT*, 6 February 1871, 2; “Value of the ‘Madstone,’” *NYT*, 3 May 1885, 7; “The Talk of the Day,” *NYTr*, 6 November 1887, 2.

86. The standard procedure and variations are discussed in Loman D. Cansler, “Madstones and Hydrophobia,” *Western Folklore* 23 (April 1964): 95–105, on 100–101.

87. “The Mad-Stone,” *NYTr*, 4 July 1854, 6; “The Madstone,” *BDE*, 24 September 1886, 2, reprinted from the *Kansas City Times*; “Death from Hydrophobia,” *BDE*, 9 October 1893, 5.

88. “The Madstone,” *BDE*, 24 September 1886, 2, reprinted from the *Kansas City Times* (re: “the Mascot”); “The ‘Fauquier Mad-Stone,’” *NYT*, 1 February 1871, 4; “Value of the ‘Madstone,’” *NYT*, 3 May 1885, 7; “Cured by a Mad Stone,” *BDE*, 7 April 1891, 1. In the 1960s, Loman D. Cansler also documented multiple stories of madstones said to have successfully treated hundreds of people, as well as the regular naming of individual stones. Cansler, “Madstones and Hydrophobia,” 102–3.

89. “Applying the Mad Stone,” *NYT*, 4 April 1886, 9.

90. “Against Hydrophobia,” *NYH*, 2 April 1886, 9; “Newark’s Mad Dog Fright,” *NYH*, 3 March 1891, 5; “Bitten by an Enraged Dog,” *NYH*, 5 March 1891, 5.

91. “A Mad Stone,” *NYH*, 18 July 1870, 11; “The Madstone,” *BDE*, 24 September 1886, 2; “The ‘Fauquier Mad-Stone,’” *NYT*, 1 February 1871, 4.

92. “A Genuine Madstone: Cases of Dog-Bite It Has Cured,” *NYTr*, 11 August 1889, 12; Kenneth L. Ketner, “Superstitious Pigeons, Hydrophobia, and Conventional Wisdom,” *Western Folklore* 30 (January 1971): 1–17, on 8.

93. Virgil J. Vogel, *American Indian Medicine* (Norman: University of Oklahoma Press, 1970), chs. 3 and 4; Eugene D. Genovese, *Roll, Jordan, Roll: The World the Slaves Made* (New York: Vintage Books, 1976; originally published 1974), 217–18, 224–28. Todd L. Savitt’s study in the late 1970s placed a greater emphasis on separation between white and black medical practices than Genovese’s account but still conceded occasional white borrowing. Savitt, *Medicine and Slavery: The Diseases and Health Care of Blacks in Antebellum Virginia* (Urbana: University of Illinois Press, 1978), 171–84, esp. 173–74.

94. Shepard Krech III, *The Ecological Indian: Myth and History* (New York: W. W. Norton, 1999), intro.; Leah Dilworth, *Imagining Indians in the Southwest: Persistent Visions of a Primitive Past* (Washington, DC: Smithsonian Institution Press, 1996), 58–59; John M. Coward, *The Newspaper Indian: Native American Identity in the Press, 1820–90* (Urbana: University of Illinois Press, 1999), 8–9.

95. “Hydrophobia—Remarkable Cure by Applying the ‘Mad Stone,’” *BDE*, 17 November 1865, 2, originally printed in the *Utica Ledger* (IN); Cansler, “Madstones and Hydrophobia,” 103.

96. “Madstone Made Famous by Scott to be Sold,” *NYH*, 6 November 1898, sec. 6, p. 5; “Suit for a Madstone,” *NYT*, 20 November 1898, 8; “Topics of the Times,” *NYT*, 20 March 1899, 6. Accurate wage statistics are difficult to come by, but Paul Starr identified a range of about \$700 to \$1,500 for physicians’ average annual earnings at the turn of the century. Starr, *The Social Transformation of American Medicine*, 84–85.

97. Michael Sappol, *A Traffic of Dead Bodies: Anatomy and Embodied Social Identity in Nineteenth-Century America* (Princeton, NJ: Princeton University Press, 2002), ch. 9. The popularity of taxidermy as a hobby also spoke to the cultural status of natural history. Less than ten blocks north of the American Museum, John G. Bell’s taxidermy shop flourished, as did John Wallace’s outfit to the south near Wall Street. During the middle decades of the nineteenth century, the two taxidermists inspired a generation of New York boys whose collecting habits prepared them for lives as working naturalists and scientists, or interested amateurs such as Theodore Roosevelt, among many others. Mark V. Barrow Jr., “The Specimen Dealer: Entrepreneurial Natural History in America’s Gilded Age,” *Journal of the History of Biology* 33 (Winter 2000): 493–534, on 498–501.

98. Lukas Rieppel, “Bringing Dinosaurs Back to Life: Exhibiting Prehistory at the American Museum of Natural History,” *Isis* 103 (September 2012): 460–90.

99. Karen Halttunen, *Confidence Men and Painted Women: A Study of Middle-Class Culture in America, 1830–1870* (New Haven, CT: Yale University Press, 1982); James W. Cook, *The Arts of Deception: Playing with Fraud in the Age of Barnum* (Cambridge, MA: Harvard University Press, 2001), esp. ch. 2; Michael Pettit, “‘The Joy in Believing’: The Cardiff Giant, Commercial Deceptions, and Styles of Observation in Gilded Age America,” *Isis* 97 (December 2006): 659–77; Lukas Rieppel, “Bringing Dinosaurs Back to Life.”

100. Charles E. Lee, editor, “To the Patrons of the Journal,” *NYMJ* 5 (July 1845): i (for a statement against quackery); W. J. Byrne, “Case of Spontaneous Combustion,”

NYJM 11 (November 1851): 399, reprinted from the *Nashville Journal of Medicine and Surgery*.

101. “A Parasitic Foetus,” *MR* 37 (15 March 1890), 304. The article apparently described a case of what is now known as fetus in fetu, a rare developmental condition in which either one fetus develops around and encloses another or a teratoma presents with a fetus-like appearance.

102. Rieppel, “Bringing Dinosaurs Back to Life.”

103. Halttunen, *Confidence Men and Painted Women*, ch. 2; Cook, *The Arts of Deception*, ch. 2; Pettit, “‘The Joy in Believing.’”

104. [Untitled], *NYT*, 22 August 1855, 2; “Miscellaneous News Items,” *BDE*, 24 September 1867, 1.

105. “Personal,” *NYT*, 26 August 1862, 6.

106. “Hydrophobia—The Madstone of No Avail,” *NYT*, 9 April 1856, 1; “In Search of a Madstone,” *NYT*, 9 July 1886, 5; “The Madstone Failed to Work,” *BDE*, 6 February 1889, 4; “Bitten by a Mad Dog,” *BDE*, 24 June 1890, 4.

107. “An Invention Wanted for Virginia Legislators’ Use,” *NYT*, 13 January 1873, 8, reprinted from the *Richmond Dispatch*; “Rabid Dogs in Brooklyn,” *NYT*, 27 April 1879, 5.

108. “Hydrophobia,” *NYTr*, 11 July 1854, 4.

109. “Current Notes,” *NYT*, 23 December 1870, 2, based on reports from the *Baltimore Sun*.

110. “The Mad-Stone Delusion—Death from Hydrophobia,” *NYT*, 25 July 1870, 8, reprinted from the *Missouri Republican*.

111. “The Madstone,” *NYT*, 20 June 1885, 4.

112. “Curing with a Madstone,” *NYTr*, 9 April 1899, SM2.

113. “The Kentucky Girl and the Madstone,” *BDE*, 30 July 1872, 2.

114. “Madstones and Scientists,” *BDE*, 26 July 1884, 4.

115. “The ‘Fauquier Mad-Stone,’” *NYT*, 1 February 1871, 4.

116. “Deadly Poisons Tried on Human Beings,” *NYT*, 14 February 1904, 11.

117. “Cure for the Hydrophobia,” *NYH*, 20 July 1837, 4; Letter to the Editor from M. Carroll, “Hydrophobia,” *NYTr*, 7 July 1848, 4; Letter to the Editor from M. Carroll, “A Cure for Hydrophobia,” *NYH*, 6 July 1848, 1.

118. [Frédéric] Buisson, *Traité de l’Hydrophobie (Vulgairement Appelée Rage), Suivi des Moyens Préservatifs et Curatifs* (Paris, 1825), vi, vii, 16–19 (quotation on 19).

119. Buisson, *Traité de l’Hydrophobie*, 19–20, 22, 32. The quotation is on 22.

120. George Weisz, “Constructing the Medical Élite in France: The Creation of the Royal Academy of Medicine 1814–1820,” *Medical History* 30 (1986): 419–43.

121. [Frédéric] Buisson, *Réponse au Rapport Fait et Présenté par MM. les Commissaires de l’Académie Royale de Médecine* (Paris, 1826), 4–6 (first quotation on 6); “Hydrophobie,” *Archives Générales de Médecine* 11 (May 1826): 140–41 (second quotation on 141).

122. [Frédéric] Buisson, *Réponse au Rapport Fait et Présenté par MM.*

123. [Frédéric] Buisson, *Avis extraordinaire* ([Paris], 1828).

124. [Frédéric] Buisson, *Traité sur l’Hydrophobie, ou Rage*, 2nd ed. (Paris, 1836), quotations on 3, 5, 6, and 7, respectively.

125. “Hydrophobia,” *NYTr*, 9 January 1851, 3; Letter to the Editor from I. M. Comings, “Hydrophobia,” *NYTr*, 12 June 1855, 5; “Foreign Gossip,” *NYTr*, 14 November 1863,

5; “Our London Correspondence,” *NYT*, 13 July 1865, 1; “Cure of Hydrophobia,” *BDE*, 24 July 1865, 1; “Mr. Urquhart and the Turkish Bath,” *BDE*, 4 April 1866, 1; “A Cure for Hydrophobia,” *BDE*, 4 April 1866, 1; “Hydrophobia,” *BDE*, 28 April 1866, 4; “A Cure for Hydrophobia,” *BDE*, 30 January 1868, 2; “The Cure of Hydrophobia,” *NYT*, 7 March 1869, 3; “A Cure for Hydrophobia,” *NYT*, 19 April 1874, 10.

126. “General Notes,” *NYTr*, 9 March 1869, 2. See also “Miscellaneous Items,” *BDE*, 18 May 1874, 1.

127. “Hydrophobia,” *MR* 5 (2 May 1870): 110.

128. “Personal Mention,” *BDE*, 20 October 1887, 4; “Facts and Hints,” *BDE*, 30 October 1887, 11; “Death from Hydrophobia,” *NYT*, 29 July 1899, 12 (for the quotation).

129. “New Treatment for Rabies,” *MR* 51 (30 January 1897): 166.

130. Letter to the Editor from M. Hermanos [Hermance], “A Cure for Hydrophobia,” *BDE*, 22 March 1877, 2; Letter to the Editor from M. Hermance, “Hydrophobia,” *BDE*, 12 April 1877, 1 (for the quotations).

131. Harry B. Weiss and Howard R. Kemble, *The Great American Water-Cure Craze: A History of Hydropathy in the United States* (Trenton, NJ: Past Times Press, 1967), 153–54; Letter to the Editor from Charles H. Sheperd [sic], “Hydrophobia,” *BDE*, 20 March 1878, 1.

132. “Curing Hydrophobia by a Vapor Bath,” *NYTr*, 4 February 1886, 8.

133. “About Brooklyn People,” *BDE*, 7 November 1897, 7; “Was the Dog Mad?” *BDE*, 31 January 1899, 8; [advertisement], “Hydrophobia,” *BDE*, 3 February 1899, 2; “Students of Inebriety Listen to Dr. Shepard,” *BDE*, sec. “News. Editorial,” 21 December 1902, 1; Letter to the Editor from Charles H. Shepard, “Remedy for Blood Poisoning,” *NYT*, 15 July 1907, 6.

134. Letter to the Editor from Luigi Galvani Doane, “Vapor Baths for Hydrophobia,” *NYT*, 15 December 1897, 6.

135. Weiss and Kemble, *The Great American Water-Cure Craze*, chs. 1–3; Susan E. Cayleff, *Wash and Be Healed: The Water-Cure Movement and Women’s Health* (Philadelphia: Temple University Press, 1987), 2–3, 18–21.

136. Cayleff, *Wash and Be Healed*, 33, 96, 104; Weiss and Kemble, *The Great American Water-Cure Craze*, 22, 84.

137. Buchan, *Domestic Medicine* (Norwood ed.), 13–96, 645–56; *Gunn’s Domestic Medicine*, 21–22, 142–77.

138. [Untitled], *NYJM* 7 (September 1846): 259.

139. [Untitled], *NYJM* 8 (March 1847): 230.

140. [Untitled], *NYMJ* 5 (September 1867): 515–16; Samuel Sexton, “Diseases of the Ear from Bathing,” *MR* 13 (27 April 1878): 343–48, on 347; “Danger of Vapor Baths,” *MR* 11 (19 August 1876): 556; “The Fever Therapy of Gonorrhea,” *MR* 89 (1 January 1916): 22.

141. “Reports from Societies (East River Medical Association, 2 April 1866),” *MR* 1 (2 April 1866): 90–91, on 91 (Bright’s disease); “Reports of Societies” (New York Pathological Society, 8 September 1880), *MR* 18 (8 September 1880): 380–85, on 381 (Bright’s disease); George Roe Lockwood, “Impacted Renal Calculus, with the Report of a Case,” *MR* 33 (26 May 1888): 576–79, on 576; “Remarks on the Causes and Treatment of Edema,” *MR* 67 (3 June 1905): 868–69, on 869; “State Medical Licensing Boards. State Board Examination Questions. Board of Medical Examiners, State of Georgia,” *MR* 83 (4 January 1913): 42–45, on 45 (uremia); “State Medical Licensing Boards. State Board

Examination Questions. Medical Examining Board of Virginia,” *MR* 83 (21 June 1913): 1149–52, on 1152 (acute nephritis); “Treatment of Chronic Nephritis,” *MR* 85 (11 April 1914): 673; Wolfred Nelson, “Yellow Fever,” *MR* 36 (13 July 1889): 29–34, on 32 (on yellow fever); J. G. Sewall, “Cerebro-Spinal Meningitis,” *MR* 7 (15 June 1872): 265–68, on 268 (on cerebrospinal meningitis); “William Benjamin Carpenter,” *MR* 28 (14 November 1885): 551, and “Thalassotherapy of Chronic Rheumatism,” *MR* 96 (25 October 1919): 705–6, on 705 (on rheumatism); “Turkish Baths and American ‘Tipple,’” *MR* 37 (15 February 1890): 194 (as obesity treatment); Jean Dandel, “Gonorrheal Rheumatism in Arthritic Subjects,” *MR* 83 (25 January 1913): 150–53, on 152.

142. Smith, *Report of a Case of Hydrophobia*, 51.

143. “Death from Hydrophobia,” *NYT*, 29 July 1899, 12; see also “Vapor Baths Did Not Save Him,” *BDE*, 28 July 1899, 14.

144. “Boy Dies from Dog Bite,” *NYT*, 14 October 1899, 4.

145. “Poisons and Russian Baths,” *BDE*, 28 July 1899, 4.

146. Diane L. Beers, *For the Prevention of Cruelty: The History and Legacy of Animal Rights Activism in the United States* (Athens: Swallow Press / Ohio University Press, 2006), 40–58; Jennifer Mason, *Civilized Creatures: Urban Animals, Sentimental Culture, and American Literature, 1850–1900* (Baltimore: Johns Hopkins University Press, 2005), 27, 100; Pratik Chakrabarti, “Beasts of Burden: Animals and Laboratory Research in Colonial India,” *History of Science* 48 (June 2010): 125–51. *OAF* devoted regular space to chronicling the activities of SPCAs around the world, a fact that testifies to animal welfare advocates’ awareness of their participation in a global cause.

147. *OAF* 25 (November 1897): 52. Had they known, ASPCA leaders would have been appalled to learn that in June 1897, a staff member at the Department of Health’s Research Laboratory transferred “all the old used antitoxin [guinea] pigs” to “Rabies work,” because it “would be a very good way to get rid of them.” Robert J. Wilson to William H. Park, 3 June 1897, reprinted in Wade W. Oliver, *The Man Who Lived for Tomorrow: A Biography of William Hallock Park, M.D.* (New York: E. P. Dutton and Company, 1941), 160.

148. “Bergh on Pasteur,” *NYH*, 11 December 1885, 6; [untitled], *BDE*, 14 December 1885, 2.

149. John P. Haines, “Hints for the Dog Days,” *OAF* 24 (July 1897): 245–46, on 245. Caroline E. White of the Philadelphia Society for the Prevention of Cruelty to Animals, another major American center of the animal welfare movement, similarly backed Buisson treatment over Pasteurian vaccination. “‘New Treatment for Hydrophobia,’” *MR* 51 (9 January 1897): 58.

150. “The Shelter for Animals,” *OAF* 21 (May 1894): 193–95, on 195; “A National Dog Protective Society,” *OAF* 22 (August 1895): 266; [untitled], *OAF* 23 (October 1895): 30; “Rabies and Hydrophobia: The Dog Days,” *OAF* 24 (July 1897): 241–45, on 242; “Rabies: Report of a Committee of the American Kennel Club,” *OAF* 25 (May 1898): 193–95, on 195; “The Mad-Dog Scare Again,” *OAF* 27 (July 1900): 241–43, on 241–42; “Recurrence of ‘The Mad Dog Scare,’” *OAF* 29 (July 1902): 241–43; “If Bitten by a Dog,” *BDE*, 27 June 1902, 6. Anti-vivisectionists and their allies in New York City outside the auspices of the ASPCA also objected vociferously to the cruelty to animals inherent in Pasteur treatment and touted the superior virtues of Buisson’s methods. See Letter to the Editor from Grace F. Reed, treasurer, New York State Anti-Vivisection Society, “The

Buisson Cure for Hydrophobia,” *NYTr*, 29 May 1897, 10; Letter to the Editor from “Faith,” “The Treatment of Rabies,” *NYTr*, 19 March 1898, 7; Letter to the Editor from “Reader,” “Letters to the Editor,” *NYTr*, 27 March 1898, A6; Letter to the Editor from “Buissonite,” “Pasteur Hydrophobia Treatment,” *NYTr*, 5 April 1898, 8; “The Witchcraft of To-Day,” *NYTr*, 30 January 1899, 5.

151. Gerald L. Geison, *The Private Life of Louis Pasteur* (Princeton, NJ: Princeton University Press, 1995), ch. 8.

152. D. E. Salmon, “Is Rabies a Specific Disease?” *MR* 60 (23 November 1901): 801–5, on 801.

153. Tomes, “American Attitudes toward the Germ Theory of Disease,” 32–33.

154. Animal welfare advocates’ invocation of medical opinion against vivisection include Albert Leffingwell, “A Discussion of Vivisection,” *OAF* 20 (July 1893): 251–54, esp. 252; “Vivisection in Schools,” *OAF* 23 (November 1895): 49–55, esp. 52–53; “Experiments on Living Animals: Views of an Eminent Medical Man,” *OAF* 23 (June 1896): 217–22; and “Sir Benjamin Ward Richardson on Biological Experiment,” *OAF* 24 (January 1897): 97–105. On their reliance on medical authorities who opposed Pasteurian rabies vaccination, see, among other examples, “Dr. Elmer Lee on Rabies, Hydrophobia, and the Pasteur Treatment,” *OAF* 25 (November 1897): 49–52; “Another Year’s Investigation of the Mythology of Hydrophobia,” *OAF* 26 (February 1899): 124–26; “Doctors Discuss Pasteur,” *NYTr*, 28 July 1899, 8; and “The Late Dr. I. C. Rosse on Hydrophobia,” *OAF* 30 (June 1903): 220–21.

155. The quotations are found, respectively, in “Hydrophobia and Its Preventive Treatment: An Analysis of Some Cases,” *MR* 55 (11 March 1899): 369–71, on 369, and “Rabies (Not) on Staten Island,” *OAF* 26 (May 1899): 194–96, quotation on 195.

156. “Convinced by Death,” *NYTr*, 17 March 1903, 14.

157. Salmon, “Is Rabies a Specific Disease?,” 801.

158. “Dog’s Bite May Cause Death,” *NYTr*, 28 July 1899, 1.

Chapter 4 • The Lesion of Doom

1. See, for example, [George Hayward and Thomas W. Blatchford], “Cases of Hydrophobia,” reprinted from the *Boston Medical and Surgical Journal*, 1854, copy in the New York Academy of Medicine Library, New York, NY; Thomas Turner, “Report of a Case of Hydrophobia, with Post-mortem Appearances,” *NYJM* 15 (November 1855): 353–56; J. Lewis Smith, “Analysis of One Hundred and Thirty-One Cases of Hydrophobia,” *NYJM* 16 (January 1856): 60–62; J. Lewis Smith, “Analysis of One Hundred and Thirty-One Cases of Hydrophobia [cont.],” *NYJM* 16 (March 1856), 216–19; “Hydrophobia,” *NYT*, 11 July 1874 5; “A Victim of Hydrophobia,” *NYT*, 15 September 1876, 8; “Cases with Hydrophobic Symptoms—Remarks on the Nature of Hydrophobia by Dr. Mills” [1880], 7, Bound Pamphlet 393, New York Academy of Medicine Library, New York, NY, also available in “Remarks on the Nature of Hydrophobia by Dr. Mills,” in James Collins, Charles K. Mills, and Carl Seiler, “Cases with Hydrophobia Symptoms,” read before the Philadelphia County Medical Society, 25 May 1880, *Proceedings of the Philadelphia County Medical Society* 2 (1880): 107–14; and Horatio R. Bigelow, *Hydrophobia* (Philadelphia: D. G. Brinton, 1881), chs. 2 and 11.

2. Michael Sappol, *A Traffic of Dead Bodies: Anatomy and Embodied Social Identity*

in *Nineteenth-Century America* (Princeton, NJ: Princeton University Press, 2002), chs. 2 and 3, quotation on 65.

3. John Harley Warner, *Against the Spirit of System: The French Impulse in Nineteenth-Century American Medicine* (Princeton, NJ: Princeton University Press, 1998), 6 (for the quoted phrase) and 232–42.

4. Russell C. Maulitz has captured this notion particularly well in his description of early nineteenth-century French pathology: “Disturbances of the body economy were best understood by analyzing the subtle checks and balances between membranous systems, and between fluids and solids of the body economy, characteristic of the new pathology.” Maulitz, *Morbid Appearances: The Anatomy of Pathology in the Early Nineteenth Century* (Cambridge: Cambridge University Press, 1987), 104.

5. Warner, *Against the Spirit of System*, 25–26, 32–37.

6. Maulitz, *Morbid Appearances*, intro. and part I; Warner, *Against the Spirit of System*, chs. 4 and 8. As Maulitz has explained in detail, the pathological anatomy of Bichat, Laennéc, and other luminaries of Paris medicine moved away from an older surgical mentality that identified lesions with localized derangements and instead conceptualized pathological anatomy in systemic terms, in which lesions needed to be correlated with their manifestations as illness.

7. Howard B. Burchell, “Osler: In Quest of the Gnostic Grail in Morbid Anatomy,” *Journal of the History of Medicine and Allied Sciences* 30 (July 1975): 235–49, esp. 238, 241–43. See also Edward T. Morman, “Clinical Pathology in America, 1865–1915: Philadelphia as a Test Case,” *Bulletin of the History of Medicine* 58 (Summer 1984): 198–214.

8. The historical literature has made much of conflicts between “French” and “German” medicine. Consider, for example, Laurent Loison’s recent account of French microscopists’ critiques of German cellular pathology. Loison, “The Microscope against Cell Theory: Cancer Research in Nineteenth-Century Parisian Anatomical Pathology,” *Journal of the History of Medicine and Allied Sciences* 71 (July 2016): 271–92. American physicians, however, chose to be syncretic in how they used European medical science.

9. “Pathological Anatomy of Rabies Canina,” *NYMJ* 14 (October 1871): 432–33.

10. Indeed, a later report from Lyons of Rudnew’s results, summarized in the *Medical Record*, also described them in French pathological terms and emphasized his detection of lesions in the kidneys. “Alterations of the Kidneys in Hydrophobia,” *MR* 7 (1 August 1874): 348.

11. “A Lecture on Hydrophobia,” *NYTr*, 4 July 1874, 2.

12. “More Hydrophobia,” *NYH*, 27 June 1874, 4.

13. On this point, see also John Douglas Blaisdell, “A Frightful, but Not Necessarily Fatal, Madness: Rabies in Eighteenth-Century England and English North America” (PhD diss., Iowa State University, 1995), 38–39, 59, 82–83.

14. [Hayward and Blatchford], “Cases of Hydrophobia,” 4–5.

15. J. Lewis Smith, “Analysis of One Hundred and Thirty-One Cases of Hydrophobia,” 60, 62.

16. Smith’s statistical survey also likely reflected the reach of Paris, particularly the statistical medicine of Pierre-Charles-Alexandre Louis. Russell M. Viner has sensed English statistical methods behind Smith’s outlook. Viner, “Healthy Children for a New World: Abraham Jacobi and the Making of American Pediatrics” (PhD diss., University

of Cambridge, 1997), 185. Smith's medical lineage, however, combined with the centrality of Louis to the American reception of Paris medicine, suggests a French connection in Smith's data-gathering zeal. When Smith studied as a medical student in Buffalo, New York, his preceptors were Austin Flint and Frank H. Hamilton, both of whom had studied in Paris. Ellsworth Eliot, "Memorial of the Late J. Lewis Smith, M.D.," in *Transactions of the New York Academy of Medicine, 1896–1901* (New York: [New York Academy of Medicine], 1903), 220–31, on 224; Warner, *Against the Spirit of System*, 92–93, 294, 299 (on Flint), 87, 94 (on Hamilton), and 167–69 (on Louis's American following).

17. S. W. Budd, "Case of Hydrophobia," *NYMJ* 24 (December 1876): 604–7, on 607.

18. "A Child's Terrible Death," *NYT*, 4 August 1878, 1.

19. Bigelow, *Hydrophobia*, 44, 53–55.

20. Bigelow, *Hydrophobia*, 149–50.

21. "More Hydrophobia," *NYTr*, 26 June 1874, 1; "Another Case of Hydrophobia," *NYT*, 26 June 1874, 5; "Hydrophobia," *BDE*, 26 June 1874, 2; "Hydrophobia and Death," *NYS*, 26 June 1874, 1.

22. On the historical significance of the odd case, see Michael Sappol, "The Odd Case of Charles Knowlton: Anatomical Performance, Medical Narrative, and Identity in Antebellum America," *Bulletin of the History of Medicine* 83 (Fall 2009): 460–98.

23. "Another Case of Hydrophobia," *NYT*, 26 June 1874, 5; "Hydrophobia," *BDE*, 26 June 1874, 2.

24. "More Hydrophobia," *NYTr*, 26 June 1874, 1.

25. Bonnie Ellen Blustein, *Preserve Your Love for Science: Life of William A. Hammond, American Neurologist* (Cambridge: Cambridge University Press, 1991), chs. 1–4. Brown-Séquard would later become infamous for advocating rejuvenation therapy through the use of animal extracts, a fad that Hammond also embraced as part of a career that, as Blustein notes, frequently "paralleled that of Brown-Séquard." Blustein, *Preserve Your Love for Science*, chs. 12 and 13, quotation on 205.

26. Blustein, *Preserve Your Love for Science*, chs. 5 and 6. Hammond founded and edited the *Quarterly Journal of Psychological Medicine and Medical Jurisprudence* in 1867, published the landmark textbook *A Treatise on the Diseases of the Nervous System* four years later, and was avidly involved in the New York Neurological Society (which he helped to found in 1872), the New York Medico-Legal Society, and other organizations that defined the rich associational offerings of New York medicine in the last third of the nineteenth century. He also placed his imprint on New York City's medical establishment by launching the New York State Hospital for Diseases of the Nervous System in 1871, along with playing a key role in founding the city's Post-Graduate Medical School in 1882. Blustein, *Preserve Your Love for Science*, ch. 6.

27. For examples of Hammond's views on the relationship between mind and body, and on the search for lesions associated with symptoms, see "Contemporary Literature [review of Hammond's *Treatise on Diseases of the Nervous System*]," *Journal of Psychological Medicine* 5 (October 1871): 784–94, esp. 787–88, 790, 792. Hammond, as journal editor, may have been the author of this summary and review of his book. For historical perspectives on materialist, somatic understandings of nervous disease in the late nineteenth century, see Cynthia Eagle Russett, *Sexual Science: The Victorian Construction of Womanhood* (Cambridge, MA: Harvard University Press, 1989), ch. 4,

and Andrew Scull, *Hysteria: The Biography* (Oxford: Oxford University Press, 2009), ch. 6. For a nineteenth-century survey, see Daniel Hack Tuke, *Illustrations of the Influence of the Mind upon the Body in Health and Disease* (London: J. and A. Churchill, 1872).

28. “Hydrophobia: A Scientific Investigation,” *NYTr*, 27 June 1874, 1. The *New York Times* provided a similar report of Hammond’s expectations: “Hydrophobia: The Latest Case,” *NYT*, 27 June 1874, 5.

29. William A. Hammond, *A Treatise on Diseases of the Nervous System* (New York: D. Appleton and Company, 1871), 556.

30. “Medical News,” *NYH*, 28 February 1854, 8 (for an early reference to the medulla oblongata as the central site of disease action in hydrophobia); Tuke, *Illustrations of the Influence of the Mind upon the Body*, 112–13, 119, 170 (regarding the state of knowledge about the medulla oblongata as of the early 1870s); “Hydrophobia,” *NYTr*, 1 July 1874, 1; “Hydrophobia,” *NYH*, 2 July 1874, 5; “Light on Hydrophobia,” *NYS*, 3 July 1874, 1.

31. For commentary on the promise of microscopy following McCormick’s death, see “Hydrophobia Again,” *NYTr*, 1 July 1874, 4, and “The Cause of Hydrophobia,” *BDE*, 1 July 1874, 2. On Hammond’s effort to rein in his preliminary conclusions, see “A Card from Dr. Hammond,” *NYTr*, 2 July 1874, 5.

32. Compare, for example, the *Tribune*’s conclusion that Hammond’s findings meant “the scientist can say with certainty that a man has or has not died of hydrophobia” versus the *Herald*’s skeptical warning that supposed “hydrophobic lesions” could easily be the mere consequence of symptoms rather than the unique product of a specific disease. “Hydrophobia,” *NYTr*, 2 July 1874, 5; and “Rabies or Fright?” *NYH*, 3 July 1874, 4.

33. Sappol, *A Traffic of Dead Bodies*, chs. 6–9.

34. “Proceedings of Societies: New York Neurological Society, July 7th, 1874,” *Psychological and Medico-Legal Journal* 1 (1874): 164–88, on 171–73, quotations on 171, 172.

35. “The Hydrophobia Inquest,” *NYTr*, 16 July 1874, 8.

36. “The M’Cormick Hydrophobia Case,” *NYT*, 18 July 1874, 1. A copy of the original coroner’s verdict in the McCormick case is also available on microfilm: NYC Office of the Coroner, Roll 4055, Coroner’s Journal/Record of Inquest, 5/10/1874–10/22/1874, Municipal Archives, New York, NY.

37. “Hydrophobia,” *NYMJ* 20 (August 1874): 218–19, quotation on 219; “Hydrophobia,” *MR* 9 (1 August 1874): 405–7, quotation on 405. See also Letter to the Editor from Emil W. Hoeber, “Newspaper Discussion Deprecated,” *NYTr*, 18 July 1874, 7. For Shrady’s background, consult “Dr. Shrady, Dead,” *NYT*, 1 December 1907, 11; John Shrady, *The College of Physicians and Surgeons, New York*, vol. 1 (New York: Lewis Publishing Company, 1903), 468–69; and James J. Walsh, *History of Medicine in New York: Three Centuries of Medical Progress*, vol. 2 (New York: National Americana Society, 1919), 350. Among other notable career milestones, Shrady helped to attend former president Ulysses S. Grant during his final illness, as well as President James R. Garfield prior to his death from an assassin’s bullet. He also assisted in the autopsy of Charles Guiteau, Garfield’s assassin, after Guiteau’s conviction and execution.

38. “Hydrophobia,” *MR* 9 (1 August 1874): 405–07, quotations on 406; emphasis original.

39. “Hydrophobia,” *MR* 9 (1 August 1874): 406.

40. "A Case of Hydrophobia Fright," *NYTr*, 1 July 1874, 5; "The Summer Curse," *NYH*, 2 July 1874, 5; and, for the quotation, "Dangerous Dogs," *NYH*, 3 July 1874, 6.
41. "A Jury That Stepped Outside of Its Province," *NYTr*, 30 July 1874, 3.
42. William A. Hammond, "The Scientific Value of the Results of the Post-mortem Examination in the Case of William McCormick, Dead of Hydrophobia," *NYMJ* 20 (September 1874): 261–69, on 263.
43. "A Jury That Stepped Outside of Its Province," *NYTr*, 30 July 1874, 3; Hammond, "The Scientific Value of the Results of the Post-mortem Examination," 263–65.
44. Hammond, "The Scientific Value of the Results of the Post-mortem Examination," 265–67.
45. Charles P. Russel, Letter to the Editor, "The Hydrophobia Question," *MR* 9 (15 July 1874): 378–80, on 378–79; "Obituary: Charles P. Russell, M.D.," *NYH*, 13 January 1886, 14.
46. Hammond, "The Scientific Value of the Results of the Post-mortem Examination," 267.
47. Hammond, "The Scientific Value of the Results of the Post-mortem Examination," 268–69; George F. Shrady, "The Rights of Independent Criticism and the Suit for Libel against the Medical Record," *MR* 9 (15 September 1874): 485–88, on 485.
48. Charles P. Russel, Letter to the Editor, *NYMJ* 20 (October 1874): 417–23, on 418–19.
49. Russel, Letter to the Editor, *NYMJ* 20 (October 1874): 419–20.
50. Russel, Letter to the Editor, *NYMJ* 20 (October 1874): 420–22.
51. Russell Viner, "Abraham Jacobi and German Medical Radicalism in Antebellum New York," *Bulletin of the History of Medicine* 72 (1998): 434–63, on 436–39; "Abraham Jacobi—Pediatric President of the AMA," *Journal of the American Medical Association* 182 (20 October 1962): 294–95, on 294.
52. Viner, "Abraham Jacobi and German Medical Radicalism"; Carla Bittel, *Mary Putnam Jacobi and the Politics of Medicine in Nineteenth-Century America* (Chapel Hill: University of North Carolina Press, 2009), 155–60; "Abraham Jacobi—Pediatric President of the AMA," 294. On Virchow and social medicine, see Erwin H. Ackerknecht, *Rudolf Virchow: Doctor, Statesman, Anthropologist* (Madison: University of Wisconsin Press, 1953), esp. 44–46, 123–45.
53. See, for example, A. Jacobi, "On the Pathology and Treatment of the Different Forms of Croup," *American Journal of Obstetrics* 1 (May 1868): 13–65 for examples of Jacobi's attention to medical chemistry and pathological anatomy (esp. 14, 24–25, 34–35), as well as his general ability to integrate the medical literature with his own clinical findings.
54. Abraham Jacobi, Letter to the Editor, *NYMJ* 20 (October 1874): 423–28, quotations on 424, 425.
55. Jacobi, Letter to the Editor, *NYMJ* 20 (October 1874): 426–28.
56. Shrady, "The Rights of Independent Criticism," 485–88.
57. See, for example, William A. Hammond, *A Treatise on the Diseases of the Nervous System*, 7th ed. (New York: D. Appleton and Company, 1881), 676–681.
58. On continuity and gradual evolutionary change as more accurate descriptors of the reception of germ theory than metaphors of revolution, see Michael Worboys's study of germ-based theories in late nineteenth-century Britain: Worboys, *Spreading*

Germs: Disease Theories and Medical Practice in Britain, 1865–1900 (Cambridge: Cambridge University Press, 2000).

59. Tomes, “American Attitudes toward the Germ Theory of Disease”; see also Margaret Warner, “Hunting the Yellow Fever Germ: The Principle and Practice of Etiological Proof in Late Nineteenth-Century America,” *Bulletin of the History of Medicine* 59 (Fall 1985): 361–82, esp. 365 for the quotation from Jacobi.

60. Neil Pemberton and Michael Worboys, *Mad Dogs and Englishmen: Rabies in Britain: 1830–2000* (Houndmills: Palgrave Macmillan, 2007), 111, 116–18.

61. “The Inoculation Treatment of Hydrophobia,” *MR* 28 (7 November 1885): 519. For Shrady’s continued agnosticism toward Pasteurian rabies vaccination, see “Pasteurism and the Palace of Hydrophobia,” *MR* 35 (9 March 1889): 269. By the fall of 1889, however, he seemed convinced, and he condemned the *Medical Standard* for backing “the silly assertion of a rabid anti-Pasteurite.” [Untitled], *MR* 36 (26 October 1889): 465.

62. Scull, *Hysteria: The Biography*, 75–76, 85–87, 105–11; David G. Schuster, *Neurasthenic Nation: America’s Search for Health, Happiness, and Comfort, 1869–1920* (New Brunswick, NJ: Rutgers University Press, 2011), 14–17; Charles E. Rosenberg, “George M. Beard and American Nervousness,” in *No Other Gods: On Science and American Social Thought* (Baltimore: Johns Hopkins University Press, 1976), 98–108; David R. Kumar, Florence Aslinia, Steven H. Yale, and Joseph J. Mazza, “Jean-Martin Charcot: The Father of Neurology,” *Clinical Medicine and Research* 9 (March 2011): 46–49.

63. Michael Worboys has identified similar objections among British critics of germ-based theories of disease and illness, who cited lack of evidence about the actual physical, chemical, and biological mechanisms by which germs’ presence produced disease and illness: Worboys, *Spreading Germs*, 3.

64. For a range of representative examples, see [untitled], *NYTr*, 14 June 1851, 6; “Horrible Case of Hydrophobia,” *BDE*, 23 January 1863, 3, reprinted from *E. D. Times*; and “Hydrophobia,” *NYT*, 27 January 1872, 8. Such concerns were consistent with constitutionalist notions about the importance of maintaining bodily equilibrium.

65. J. Lewis Smith, “Report of a Case of Hydrophobia; with Statistical Observations,” *NYJM* 15 (September 1855): 233–45, on 241; Thomas H. Gage, *A Case of Hydrophobia: With Remarks* (Worcester, MA: Worcester District Medical Society, [1865]), read before the Worcester District Medical Society, January 1865, 17–18, copy in the New York Academy of Medicine Library, New York, NY; George Fleming, *Rabies and Hydrophobia: Their History, Nature, Causes, Symptoms, and Prevention* (London: Chapman and Hall, 1872), 309–10.

66. Hammond, *A Treatise on Diseases of the Nervous System*, 553–54.

67. Hammond, *A Treatise on Diseases of the Nervous System*, sec. III, ch. 1. Similarly, George Fleming’s widely read 1872 treatise distinguished between “nervous hydrophobia” and “true rabies,” with the former characterized as “a peculiar hysterical affection, or mental hydrophobia . . . which simulates the malady,” but Fleming paid relatively little attention to hydrophobia cases that resulted from nervousness or fright, and his short discussion of imagined cases focused primarily on diagnostic questions. Fleming, *Rabies and Hydrophobia*, 187, 262. Additional information on the nineteenth-century history of spurious hydrophobia as a disease category appears in the introduction, endnote 13.

68. On this point, recall the discussion of constitutionalism in chapter 3.

69. “Hysteria or Hydrophobia,” *BDE*, 1 July 1874, 2; “Hydrophobia,” *NYT*, 2 July 1874, 5; “Dr. Hamilton’s Opinion,” *NYT*, 2 July 1874, 5; “Opinions of Other Gentlemen,” *NYT*, 2 July 1874, 5; “Current Opinion,” *BDE*, 2 July 1874, 2; “The Supposed Case of Lyssaphobia,” *NYT*, 2 July 1874, 5; “Hydrophobia,” *NYT*, 7 July 1874, 5.

70. “Another Victim of Dogs,” *NYH*, 5 August 1874, 8; Letter to the Editor from S. G. Cook, “Hydrophobia—A Correction,” *NYT*, 6 August 1874, 4; “The Reported Case of Hydrophobia,” *NYT*, 6 August 1874, 8; “Hydrophobia Fright,” *BDE*, 6 August 1874, 4.

71. “Imaginary Hydrophobia,” *NYTr*, 23 June 1888, 7, reprinted from the *Philadelphia Times*. Hammond also recounted the case in William A. Hammond, “False Hydrophobia,” *North American Review* 151 (August 1890): 167–72, on 170–71.

72. For examples of fear-induced cases, see “Not Hydrophobia but Fright,” *NYTr*, 13 August 1875, 5; “City and Suburban News,” *NYT*, 27 August 1876, 12; and “Hydrophobia?” *NYTr*, 11 April 1877, 4. Accounts of alternative diagnoses include “Epilepsy Mistaken for Hydrophobia,” *NYT*, 6 May 1877, 2; “Symptoms of Lockjaw,” *NYT*, 3 November 1882, 8 (tetanus); “Like a Victim of Rabies,” *NYH*, 11 October 1886, 6 (previous head injury); “Thought It Was Hydrophobia,” *NYT*, 25 February 1888, 3 (acute mania); “Is It a Case of Dog Bite,” *NYH*, 30 June 1890, 8 (insanity or alcoholism); “He Says It Was Not a Case of Hydrophobia,” *NYTr*, 19 July 1893, 10 (alcoholism); “Marion Manola’s Case Not Serious,” *NYTr*, 18 August 1893, 6 (nervous prostration); “Recent Events,” *BDE*, 23 August 1895, 6 (nervous fright); “Insanity, Not Hydrophobia,” *NYTr*, 7 July 1896, 14; “Died of False Hydrophobia,” *NYTr*, 2 September 1901, 12; “Meningitis Kills Dog Catcher,” *NYTr*, 13 October 1907, 1; “Hysteria, Not Rabies,” *NYT*, 6 September 1908, 4.

73. “Hydrophobia or Imagination?” *NYT*, 30 May 1877, 5; “Imaginary Hydrophobia,” *NYT*, 31 May 1877, 5; “Hydrophobia in Hartford,” *NYT*, 1 June 1877, 1; “Hydrophobia,” *NYH*, 1 June 1877, 3; “Hydrophobia or Fright,” *NYH*, 5 June 1877, 6; “General Notes,” *NYTr*, 7 June 1877, 4; [untitled], *BDE*, 7 June 1877, 2; M. Storrs, “An Interesting Case of Hydrophobia and a Question of Diagnosis,” *MR* 12 (30 June 1877): 418–21.

74. “Current Events,” *BDE*, 10 April 1877, 2; “Current Events,” *BDE*, 19 April 1877, 2; “Hydrophobia?” *NYTr*, 11 April 1877, 4; [untitled], *NYTr*, 18 April 1877, 4 (for the quotation about the horse); “Local Miscellany,” *NYTr*, 18 April 1877, 2.

75. See, for example, William Osler, “Hydrophobia (Lyssa—Rabies),” in *A Text-Book on Nervous Diseases by American Authors*, ed. Francis X. Dercum (Philadelphia: Lea Brothers and Co., 1895), 215–19, on 217–18.

76. “Remarks on the Nature of Hydrophobia by Dr. Mills,” in James Collins, Charles K. Mills, and Carl Seiler, “Cases with Hydrophobia Symptoms,” 107–14, quotation on 112. A summary of Mills’s claims also appeared in the *Medical Record*: “The Pathology of Hydrophobia,” *MR* 18 (4 September 1880): 271. Ten years later, Mills noted that serious medical consideration of pseudo-hydrophobia had begun about a decade earlier, and one assumes he had his own experience in mind. “Remarks by Dr. Mills,” in Charles K. Mills and Charles J. Hoban, “Remarks on Two Cases Simulating Hydrophobia and Occurring after Dog-Bites,” *Journal of Nervous and Mental Disease* 15 (December 1890): 848–54, on 849.

77. Mills and Hoban, “Remarks on Two Cases Simulating Hydrophobia and Occurring after Dog-Bites,” 849.

78. Mills and Hoban, “Remarks on Two Cases Simulating Hydrophobia and Occurring after Dog-Bites,” 853–54.

79. James Grant Wilson and John Fiske, eds., *Appletons’ [sic] Cyclopaedia of American Biography*, rev. ed., vol. 5 (New York: D. Appleton and Company, 1898), 633; Charles E. Rosenberg, *The Trial of the Assassin Guiteau: Psychiatry and Law in the Gilded Age* (Chicago: University of Chicago Press, 1968), ch. 6; Rosenberg, “George M. Beard and American Nervousness,” 108 (for the quotation and Spitzka’s damning assessment of George Miller Beard’s ideas about neurasthenia).

80. E. C. Spitzka, “How Can We Prevent False Hydrophobia?” *Journal of Comparative Medicine and Surgery* 7 (July 1886): 244–67, quotations on 246, 249, and 264, respectively. Spitzka originally presented the essay before the Society of Medical Jurisprudence and State Medicine on 10 June 1886.

81. For excerpts from the public discussion, see “Did Mr. Hertline Have Hydrophobia?” *NYTr*, 30 May 1886, 11; “Using Hertlein’s [sic] Brain for Inoculation,” *NYTr*, 8 June 1886, 8; “Mad Dogs Loose among Doctors,” *NYTr*, 11 June 1886, 5; “Dr. Spitzka’s Experiments,” *NYT*, 12 June 1886, 8; Letter to the Editor from E. C. Spitzka, “Dr. Spitzka Restates His Case,” *NYTr*, 15 June 1886, 4; “Dr. Spitzka’s Dogs Show Signs of Rabies,” *NYTr*, 18 August 1886, 8; and “Irritation, Not Rabies,” *NYT*, 19 August 1886, 5.

82. “A Curious Case,” *NYTr*, 21 October 1886, 4.

83. “Irritation, Not Rabies,” *NYT*, 19 August 1886, 5.

84. Letter to the Editor from “A Physician,” “Hydrophobia,” *BDE*, 22 February 1887, 4.

85. “Hydrophobia and the Doctors,” *NYH*, 26 January 1886, 5; William A. Hammond, “False Hydrophobia,” *North American Review* 151 (August 1890): 167–72.

86. Shauna Devine, *Learning from the Wounded: The Civil War and the Rise of American Medical Science* (Chapel Hill: University of North Carolina Press, 2014), 332n121. Mitchell has become infamous within gender studies, particularly in writings about Charlotte Perkins Gilman, who herself recorded the infantilizing dimensions of the rest cure, which she found intolerable. Cynthia J. Davis, *Bodily and Narrative Forms: The Influence of Medicine on American Literature, 1845–1915* (Stanford, CA: Stanford University Press, 2000), ch. 4; Bederman, *Manliness and Civilization*, 130–32. Nancy J. Tomes, “American Attitudes toward the Germ Theory of Disease: Phyllis Allen Richmond Revisited,” *Journal of the History of Medicine and the Allied Sciences* 52 (January 1997): 17–50 makes clear the high level of interest among elite American physicians in the medical implications of germs from the 1860s onward.

87. “The Dog Scare Senseless: Dr. Hammond Questions the Value of Pasteur’s Discoveries,” *NYT*, 26 January 1886, 5. Bonnie Blustein’s biography of Hammond contains virtually no references to germ theory or bacteriology beyond a single reference to Koch and Pasteur, which suggests Hammond’s lack of attention to these areas, as compared to his capacious interests in medical chemistry, cellular pathology, physiology, neurology, electrotherapies, animal extracts and rejuvenation therapy, insanity, and other topics. Blustein, *Preserve Your Love for Science*. Hammond’s sanitarian leanings can be documented, however, through his Civil War–era treatise: William A. Hammond, *Treatise on Hygiene with Special Reference to the Military Service* (Philadelphia: J. B. Lippincott and Company, 1863), esp. section III.

88. “The Lesions in the Nervous System in Rabies,” *Journal of the American Medical*

Association 39 (20 September 1902): 702; Daniel W. Poor, “Recent Studies in the Diagnosis of Rabies,” *MR* 67 (15 April 1905): 568–70, on 568–69. In the 1970s, the standard reference source on rabies still highlighted the significance of Babes’s and Gehuchten and Nelis’s findings. P. Atanasiu, “Animal Inoculation and the Negri Body,” in George M. Baer, *The Natural History of Rabies*, vol. 1 (New York: Academic Press, 1975), 374–400, on 384.

89. D. W. Poor, “Pathological Studies in Rabies,” *Proceedings of the New York Pathological Society* 4 (October 1904): 101–9; Poor, “Recent Studies in the Diagnosis of Rabies,” 569–70.

90. Anna Wessels Williams, unpublished autobiography, chapter 14, pp. 13–14, Box 2, Folder “7 Autobiography chapters XIII–,” and chapter 16, pp. 2–6, Box 1, Folder “Chapt. XVI 1896–1908+ Mad Dog,” Anna Wessels Williams papers, Arthur and Elizabeth Schlesinger Library, Radcliffe Institute for Advanced Study, Harvard University, Cambridge, MA.

91. Anna W. Williams, “Negri Bodies, with Special Reference to Diagnosis,” *Proceedings of the New York Pathological Society* 5 (May 1905–January 1906): 155–59; Ira van Giesen, “A Rapid Method for the Detection and Study of the Negri Bodies in Hydrophobia,” *Proceedings of the New York Pathological Society* 6 (April–May 1906): 83–85, quotation on 83.

92. “Discussion” [response to Williams, “Negri Bodies, with Special Reference to Diagnosis”], *Proceedings of the New York Pathological Society* 5 (May 1905–January 1906): 159–62, quotation on 161.

93. Anna W. Williams, “The Diagnosis of Rabies,” *American Journal of Public Hygiene* 18 (1908): 10–15, on 12.

94. Anna Wessels Williams, unpublished autobiography, chapter 14, pp. 2–3 and 17, Box 2, Folder 7, Anna Wessels Williams papers; Williams and Lowden, “The Etiology and Diagnosis of Hydrophobia,” 638, 658–67; Williams, “Negri Bodies, with Special Reference to Diagnosis,” 156–57; D. W. Poor, “Pathological Studies in Rabies,” *Proceedings of the New York Pathological Society* 4 (October 1904): 101–09, on 104–06; Daniel W. Poor, “Recent Studies in the Diagnosis of Rabies,” in *Annual Report of the Board of Health of the Department of Health of the City of New York for the Year Ending December 31, 1905*, vol. II (New York: Martin B. Brown Company, 1906), 482–89, on 486–87; Langdon Frothingham, “The Rapid Diagnosis of Rabies,” *Journal of Medical Research* 14 (April 1906): 471–89, on 476.

95. P. Sourander, “Cytochemical Studies on Rabies Inclusions (Negri Bodies),” *Journal of Pathology and Bacteriology* 72 (July 1956): 257–65, on 262. Negri bodies are now considered to be composed of viral material, although why infection by laboratory strains of fixed virus, unlike infections by wild strains (so-called street rabies), frequently fails to produce Negri bodies remains a mystery. K. Kristensson et al., “Rabies: Interactions between Neurons and Viruses: A Review of the History of Negri Inclusion Bodies,” *Neuropathology and Applied Neurobiology* 22 (1996): 179–87, on 185.

96. Daniel P. Perl, “The Pathology of Rabies in the Central Nervous System,” in *The Natural History of Rabies*, ed. George M. Baer, vol. 1 (New York: Academic Press, 1975), 235–72, on 247; Centers for Disease Control and Prevention, “Negri Bodies,” <http://www.cdc.gov/rabies/diagnosis/histologic.html> (accessed January 3, 2019).

97. K. Kristensson et al., “Rabies: Interactions between Neurons and Viruses,” 185.

Similarly, the standard mid-1970s reference work on rabies noted the dramatic contrast between symptoms and morbid appearances: “In spite of the striking symptoms seen in individuals or animals with rabies, there is little grossly visible alteration of the central nervous system.” Perl, “The Pathology of Rabies in the Central Nervous System,” 235. Notably, in his work at the turn of the century, Charles Nelis also believed that one could derive the physiopathology of rabies symptoms from the cytopathology of the disease. Jean Théodoridès, “Les recherches histologiques sur la rage au 19^e siècle,” *Clio Medica* 16 (December 1981): 83–92, on 87. Similarly, Babes’s classic 1892 paper assumed that since rabies produced such a consistent set of symptoms, it must also produce characteristic lesions in the nervous system. M. V. Babes, “Sur Certains Caractères des Lésions Histologiques de la Rage,” *Annales de l’Institut Pasteur* 6 (1892): 209–23, on 210. Such guiding assumptions reflected the long reach of the Paris school’s pathological anatomy.

Chapter 5 • A Tale of Three Laboratories

1. Bert Hansen, “America’s First Medical Breakthrough: How Popular Excitement about a French Rabies Cure in 1885 Raised New Expectations for Medical Progress,” *American Historical Review* 103 (April 1998): 373–418.
2. Jean-Pierre Dedet, *Les Instituts Pasteur d’Outre-Mer: Cent vingt ans de microbiologie française dans le monde* (Paris: L’Harmattan, 2000), 14.
3. “Newark’s Rabid Dogs,” *NYH*, 5 December 1885, 6; “The Newark Children and Pasteur,” *NYH*, 8 December 1885, 4; “Newark’s Rabies Sensation,” *NYH*, 8 December 1885, 5; “On the Way to Pasteur,” *NYH*, 9 December 1885, 1.
4. “Returning from Pasteur,” *NYT*, 3 January 1886, 1; “A Pasteur Hospital for Hydrophobia Patients,” *BDE*, 2 January 1886, 2.
5. “Obituary: Alexander B. Mott, M.D.,” *NYT*, 13 August 1889, 2; “Another Terrible Death,” *NYH*, 11 July 1874, 3; “Dr. Valentine Mott Dies Suddenly at 65,” *NYT*, 20 June 1918, 13. For some of the highlights in the elder Valentine Mott’s career, see Courtney R. Hall, “The Rise of Professional Surgery in the United States: 1800–1865,” *Bulletin of the History of Medicine* 26 (1952): 242, 245–48, 251.
6. “For the Cure of Rabies,” *BDE*, 3 January 1886, 1; “Following Pasteur’s Lead,” *NYH*, 3 January 1886, 7; “Owners Seeking for Lost Pets,” *NYTr*, 3 January 1886, 3; “A Pasteur Institute for New York,” *NYTr*, 5 January 1886, 2; “A Pasteur Institute Incorporated,” *NYT*, 5 January 1886, 1.
7. “Pasteur’s Great Discovery,” *Daily News* (San Diego, CA), 4 January 1886, 2; “General News,” *Idaho Avalanche* (Silver City), 16 January 1886, 2.
8. “Dr. Alex F. Liautard Dead,” *NYT*, 23 April 1918, 13; “Death of Ex-Coroner M. J. B. Messemer,” *NYT*, 2 March 1894, 1; “Police Find Mrs. de Plasse,” *NYT*, 25 February 1898, 5 (on Louis de Plasse); “French Guests Welcomed,” *NYT*, 27 October 1886, 5 (on Charles Villa); “A Jolly Dinner Party,” *NYT*, 8 January 1887, 5 (on Charles Villa); “Charles Nirdlinger,” *NYT*, 14 May 1940, 30. Nirdlinger achieved his greatest success as a playwright and writer in the 1900s and 1910s, but some evidence of his earlier presence in New York City’s literary and theatrical life appears in “The ‘Rider and Driver,’” *NYT*, 17 December 1892, 8, and Charles Frederic Nirdlinger, *Masques and Mummies: Essays of the Theatre of Here and Now* (New York: Dewitt Publishing House, 1899). The efforts of Adolph Corbett and other concert hall owners to exempt venues

that only played orchestral music from city laws regulating amusement halls perhaps indicates efforts to change the social status of such establishments. “Concert Hall Licenses,” *NYT*, 11 July 1886, 5. In 1887, however, the *Times* described Corbett’s concert hall, the Bijou on West 14th Street, as “a notorious dive.” “Under Three Charges,” *NYT*, 6 February 1887, 3. I am not absolutely certain that the Charles Villa, Charles F. Nirdlinger, and Adolph Corbett that I have identified here are the same individuals as named in the incorporation of the American Pasteur Institute, but I have not been able to find any other possible candidates. The association of elite medical professionals with the owner of “a notorious dive” should not surprise readers, however, given historical findings about male sociability and American urban life during the late nineteenth century, including the frequency with which middle-class men visited prostitutes, as well as the proliferation of rough-edged male spaces of entertainment, such as animal-fighting dens and barefisted prize-fighting venues, whose audiences crossed class lines. John D’Emilio and Estelle B. Friedman, *Intimate Matters: A History of Sexuality in America*, 2nd ed. (Chicago: University of Chicago Press, 1997; originally published 1988), 178–83; Edward P. Buffet, “Bergh’s War on Vested Cruelty,” notes and manuscript, n.d., approx. 1929, vol. 5, folder “Sportmanship of the Pit and the Epic of Kit Burns,” American Society for the Prevention of Cruelty to Animals, New York, NY; Elliott J. Gorn, *The Manly Art: Bare-Knuckle Prize Fighting in America*, updated ed. (Ithaca, NY: Cornell University Press, 1986), 130–31, 182–83, 187–200.

9. American Pasteur Institute Articles of Incorporation quoted in “Current Events,” *BDE*, 5 January 1886, 2.

10. “To Study Hydrophobia,” *NYH*, 5 January 1886, 7. For the quotation, see “What the Doctors Say,” *NYH*, 13 January 1886, 3.

11. “What the Doctors Say,” *NYH*, 13 January 1886, 3; “Foreign Fact and Comment,” *BDE*, 21 March 1886, 15; “Foreign Fact and Comment,” *BDE*, 28 March 1886, 10; “Against Hydrophobia,” *NYH*, 2 April 1886, 9.

12. Gerald L. Geison, *The Private Science of Louis Pasteur* (Princeton, NJ: Princeton University Press, 1995), chs. 7–8, esp. 185, 189–91, 213–15; Louis Pasteur, “Méthode pour Prévenir la Rage après Morsure,” reprinted in *Oeuvres de Pasteur*, ed. Pasteur Vallery-Radot, vol. 6 (Paris: Masson et Cie., 1933), 603–10.

13. For the quotations, see the excerpts from Valentine Mott’s letter of 7 April 1886 published in “At Pasteur’s Laboratory,” *NYH*, 9 May 1886, 21. Other aspects of Mott’s Paris trip are also documented in “To Study Hydrophobia,” *NYH*, 5 January 1886, 7, and “Dr. Mott Returns from Pasteur,” *NYH*, 17 May 1886, 9. A translation of Pasteur’s report even appeared in the *Herald*: “Pasteur’s Method,” *NYH*, 2 January 1886, 5. Mott later reported that the rabbit died nine days after inoculation, and he kept the corpse on ice until his ship docked in New York City the next day, on 16 May. This timing suggests that the ship left Paris on 6 May, a month after Mott’s arrival in Paris. Valentine Mott, *Rabies and How to Prevent It: A Paper Read before the American Social Science Association, Saratoga, 8 September 1886* (Boston: Geo. E. Crosby and Company, 1887), 14. Mott’s 7 April letter to his father also indicated a planned side trip to Constantinople, which if it took place meant he spent even less time at Pasteur’s laboratory.

14. Louis Pasteur to Dr. Chautemps (vice president, Paris Municipal Council), 22 July 1886, in Pasteur Vallery-Radot, ed., *Correspondance de Pasteur 1840–1895*, vol. 4 (Paris: Flammarion, 1951), 76. On the significance of tacit knowledge and on-site

training to the dispersion of bacteriological knowledge and methods, see Ilana Löwy, “Yellow Fever in Rio de Janeiro and the Pasteur Institute Mission (1901–1905): The Transfer of Science to the Periphery,” *Medical History* 34 (1990): 144–163, on 145.

15. Geison, *The Private Science of Louis Pasteur*, 219–20, 223–26.

16. “Rabbits with the Rabies,” *Macon Telegraph* (Georgia), 22 May 1886, 3, story reprinted from the *New York Star*.

17. “Inoculation: Money Needed to Develop Pasteur’s Work in America,” *St. Louis Globe-Democrat*, 24 May 1886, 5, story reprinted from the *New York Evening Post*.

18. “The Pasteur Hospital,” *NYH*, 29 May 1886, 9.

19. “Protection from Rabies,” *NYTr*, 4 June 1886, 2.

20. “A Proposed ‘Pasteur Institute’ in New York City,” *MR* 29 (29 May 1886): 629.

21. On the social geography of surgery and pathology in the American hospital, see Charles E. Rosenberg, *The Care of Strangers: The Rise of America’s Hospital System* (New York: Basic Books, 1987), 147–48, 156–57. Michael Worboys’s account of the reception of germ theory in Britain also offers suggestive evidence of surgeons’ limited motivation and ability, with rare exceptions, to cross over into bacteriological research: Worboys, *Spreading Germs: Disease Theories and Medical Practice in Britain, 1865–1900* (Cambridge: Cambridge University Press, 2000), 170–81. Prudden’s introduction of bacteriological training to New York City and the Research Laboratory’s long path to implementing rabies vaccination are discussed in Wade W. Oliver, *The Man Who Lived for Tomorrow: A Biography of William Hallock Park, M.D.* (New York: E. P. Dutton and Company, 1941), 20, 53–54, 159–60, 173. The delays at the Research Laboratory may have involved personal travails and not just technical challenges. At the time of the early rabies work, Park developed a dangerous case of typhoid fever that required an extended absence from the laboratory, while the need to care for her brother Harry, who was dying from tuberculosis, sidelined Anna Wessels Williams during this period. Oliver, *The Man Who Lived for Tomorrow*, 153–55; Anna Wessels Williams, unpublished autobiography, chapter 13, Box 2, Folder “6 Autobiography Chapters VII–XIII,” Anna Wessels Williams papers, Arthur and Elizabeth Schlesinger Library, Radcliffe Institute for Advanced Study, Harvard University, Cambridge, MA.

22. “Pasteur’s Method in New York,” *NYH*, 29 June 1886, 9; “Independence of Hydrophobia,” *NYH*, 6 July 1886, 4 (for the quotation); “From Pasteur’s Rabbit,” *NYH*, 6 July 1886, 2; [untitled], *BDE*, 6 July 1886, 2; “The Pasteur Method: It Is Practiced by Dr. Valentine Mott in New York City,” *Galveston Daily News (Texas)*, 7 July 1886, 1; “America’s Pasteur,” *Daily Picayune* (New Orleans), 10 July 1886, 8, article reprinted from the *New York Journal*; “Gotham Gossip,” *Daily Picayune* (New Orleans), 12 July 1886, 9.

23. “Dr. Newell Is Not Dissatisfied,” *NYTr*, 14 July 1886, 5; “In the Shadow of Death,” *NYH*, 17 July 1886, 3.

24. “Pasteur’s Method,” *Kansas City Star*, 5 July 1886, 1; [untitled], “Trying Pasteur’s Method,” *Daily News* (San Jose), 6 July 1886, 1; “For the Prevention of Rabies,” *Cleveland Plain Dealer*, 7 July 1886, 6; *Trenton Times* (New Jersey), 8 July 1886, 5; “America’s Pasteur,” *Daily Picayune* (New Orleans), 10 July 1886, 8, article reprinted from the *New York Journal*; “Pasteur in America,” *Kalamazoo Gazette* (Michigan), 11 July 1886, 8; “Hydrophobia: The Pasteur Treatment on the Jersey City Boy Bitten by a Mad Dog,” *Macon Telegraph* (Georgia), 20 July 1886, 4, and also an identical account in the *Colum-*

bus Daily Enquirer (Georgia), 20 July 1886, 1; “New York Notes,” *Weekly Detroit Free Press*, 24 July 1886, 4.

25. “New York Notes,” *Weekly Detroit Free Press*, 5 June 1886, 7.

26. “Foreign Fact and Comment,” *BDE*, 6 June 1886, 7 (on Pasteur’s funding in Paris); “Protection from Rabies,” *NYTr*, 4 June 1886, 2 (on the circumstances surrounding the boys from Cincinnati and Westchester County); “Little Faith in Pasteur,” *Boston Daily Advertiser*, 7 July 1886, 1 (on donations to the API). The saga of the Newark boys immediately stirred physicians, aided by the *Herald*’s enthusiastic coverage, to call for the establishment of an institution to provide preventive hydrophobia treatment in New York City, as well as the introduction of Pasteurian techniques to the United States more generally. “Newark’s Rabid Dogs,” *NYH*, 5 December 1885, 6; “The Newark Children and Pasteur,” *NYH*, 8 December 1885, 4; “On the Way to Pasteur,” *NYH*, 9 December 1885, 8; “New York’s Danger from Dogs,” *NYH*, 18 December 1885, 2; “What Veterinarians Say,” *NYH*, 19 December 1885, 2; “The Hydrophobia Topic,” *NYH*, 4 January 1886, 3; “The Rabbit Goes Mad,” *NYH*, 24 January 1886, 14.

27. “Dr. Mott’s Regard for the Public,” *NYTr*, 24 August 1886, 8. See also “According to Pasteur’s Method,” *NYH*, 23 August 1886, 6.

28. Valentine Mott, *Rabies and How to Prevent It*, 14.

29. “Social Scientists,” *NYH*, 9 September 1886, 3; [untitled], *Springfield Republic* (MA), 9 September 1886, 8. The *Springfield Republic* also reproduced the full text of Mott’s address several weeks later but drew no special attention to the American Pasteur Institute’s most recent patients. “Rabies and Its Prevention,” *Springfield Republic* (MA), 29 October 1886, 7.

30. “According to Pasteur’s Method,” *NYH*, 2 December 1886, 9; “Hydrophobia: Story of Three Mississippi Children Bitten by a Mad Dog,” *St. Louis Daily Globe-Democrat*, 6 December 1886, 3.

31. Insufficient access to rabbits also impeded vaccination efforts in response to the Port Elizabeth rabies outbreak of 1893 in South Africa, where British colonial policy generally barred the importation of rabbits in order to prevent them from becoming an invasive species and threatening the local ecosystem, as they had in Australia. Karen Brown, *Mad Dogs and Meerkats: A History of Resurgent Rabies in Southern Africa* (Athens: Ohio University Press, 2011), 48.

32. “Another Case for Pasteur,” *NYTr*, 5 January 1887, 1. In February 1887, an article in the *New York Herald* on a recent human death from rabies identified Valentine Mott as president of the API, which suggests some kind of institutional persistence. “Hydrophobia Clearly Proven,” *NYH*, 12 February 1877, 3. An obituary for Alexander B. Mott also indicated that the API lasted for a total of two years. The author noted of the American Pasteur Institute, “The experiment was not a success, and after two years of careful trial it was abandoned.” “Alexander B. Mott Dead,” *NYH*, 13 August 1889, 5. In 1890, Valentine Mott claimed he had successfully inoculated about twenty patients against rabies, but I have not found any other evidence that suggests possible cases of Pasteur treatment at the American Pasteur Institute beyond the end of 1886. “Saved by the Virus,” *Chicago Herald*, 16 November 1890, 27. In addition to the report from January 1887 that suggested that the API had already ceased active operations, in September 1888, a woman from Dallas County, Texas, sought Pasteur treatment in New York City. Mott responded to her physician with a terse telegram: “Pasteur treatment given

up here. She must go to Paris for it.” “The Case of Hydrophobia,” *Dallas Morning News*, 21 September 1888, 8.

33. “In Fearful Paroxysms,” *NYH*, 16 November 1887, 3.

34. On the emergence of the American pharmaceutical industry, see Jonathan Liebenau, *Medical Science and Medical Industry: The Formation of the American Pharmaceutical Industry* (Houndmills, UK: Macmillan Press, 1987), esp. chs. 3–5.

35. “Following Pasteur’s Methods,” *NYT*, 19 February 1890, 2; “A Pasteur Institute,” *NYTr*, 19 February 1890, 4.

36. “Pasteur Institute,” *BDE*, 13 July 1890, 19; “Dr. Gibier’s Work,” *NYT*, 16 October 1890, 8; “Work of the New York Pasteur Institute,” *NYTr*, 20 October 1890, 7.

37. Bert Hansen, *Picturing Medical Progress from Pasteur to Polio: A History of Mass Media Images and Popular Attitudes in America* (New Brunswick, NJ: Rutgers University Press, 2009), 102.

38. Biographical information on Gibier has been drawn from “Gibier, Paul,” in *Dictionnaire de Biographie Française*, ed. M. Prevost, Roman D’Amat, and H. Tribout de Morembert, vol. 15 (Paris: Librairie Leouzey et Ané, 1982), 1458; Hansen, *Picturing Medical Progress*, 104–5; “Following Pasteur’s Methods,” *NYH*, 19 February 1890, 2; “Dr. Gibier Killed in Runaway Accident,” *NYT*, 11 June 1900, 1; “Dr. Paul Gibier,” *British Medical Journal*, 14 July 1900, 30–31; Gibier’s file in the papers of the Legion of Honor at the French National Archives, available online via the Léonore database, Le Fonds de la Légion d’Honneur aux Archives Nationales, www.culture.gouv.fr/documentation/leonore/leonore.htm (accessed January 4, 2019); and “Yellow Fever Microbes,” *NYT*, 16 October 1888, 3.

39. Paul Gibier, *Recherches Expérimentales sur la Rage et sur son Traitement* (Paris: A. Parent, 1884), quotation on 42.

40. Thomas P. Hughes warned against overestimating the prevalence of “hunt-and-try” methods in the history of American innovation, but also acknowledged their place in the work of Thomas Edison and other inventors. Hughes, *American Genesis: A Century of Invention and Technological Enthusiasm, 1870–1970* (New York: Viking Penguin, 1989), 21, 32–33, 52, 214. For an experimental example of “hunt-and-try,” consider Wilhelm Röntgen’s classic X-ray paper, in which he described the various objects on hand that he tried exposing to the new rays and photographing, including part of a door painted with lead paint, wire wrapped around a bobbin, a set of metal weights, and his wife’s hand. W. C. Röntgen, “On a New Kind of Rays,” *Nature* 53 (23 January 1896): 274–76, on 276, translated by Arthur Stanton from the *Sitzungsberichte der Würzburger Physik.-medic. Gesellschaft*, 1895. The heavy empiricism of turn-of-the-century American social science, with its emphasis on fact-gathering in order to see the real-world conditions of social life, could be considered a social scientific analogue to “hunt-and-try,” particularly Richard Ely’s commandment that scholars “look and see,” a directive that profoundly shaped the work of John R. Commons and his students. This form of empiricism also strongly reflected nineteenth-century traditions in natural history, as well as established methods of epidemiological research, and not just approaches to technological innovation. Jessica Wang, “Local Knowledge, State Power, and the Science of Industrial Labor Relations: William Leiserson, David Saposs, and American Labor Economics in the Interwar Years,” *Journal of the History of the Behavioral Sciences* 46 (Fall 2010): 371–93.

41. As Michael Worboys has noted, bacteriological methods required more skill than many interested physicians first anticipated, including “the mastery of three different technical systems: microscopy, culturing and inoculations of experimental animals.” Worboys, *Spreading Germs*, 291.

42. Gibier file, Legion of Honor; “Yellow Fever Microbes,” *NYT*, 16 October 1888, 3. On Gibier’s erroneous claim to have identified the microbial cause of yellow fever, see “The Microbe of Yellow Fever,” *British Medical Journal*, 9 February 1889, 319, and “Destructive Research,” *British Medical Journal*, 11 January 1890, 93. Gibier was far from alone in his failure. As Ilana Löwy has noted, “There were a dozen or so triumphant announcements of the isolation of the ‘yellow fever germ’ in the 1880s and 1890s,” none of which withstood withering scientific critiques. Löwy, “Yellow Fever in Rio de Janeiro,” 144.

43. John Strachan, “The Pasteurization of Algeria?” *French History* 20, no. 3 (2006): 260–75, on 263. See also Anne Marie Moulin, “Patriarchal Science: The Network of the Overseas Pasteur Institutes,” in *Science and Empires: Historical Studies about Scientific Development and European Expansion*, ed. Patrick Petitjean, Catherine Jami, and Anne Marie Moulin (Dordrecht: Kluwer Academic Publishers, 1992), 307–22, on 310–11.

44. “Pasteur Building Dedicated,” *NYT*, 11 October 1893, 9; “Dr. Gibier Killed in Runaway Accident,” *NYT*, 11 June 1900, 1.

45. “Elusive Microbes,” *NYH*, 17 September 1888, 7; “Among the Horrors,” *NYH*, 7 April 1889, 23.

46. See, respectively, “Following Pasteur’s Methods,” *NYH*, 19 February 1890, 2; “To Be New York’s Pasteur,” *NYH*, 19 February 1890, 8; “Pasteur Hospital Opened,” *Worcester Daily Spy* (MA), 19 February 1890, 3; “To Treat Hydrophobia,” *Boston Daily Advertiser*, 20 February 1890, 4; “The Gossip of Gotham: Paul Gibier, the American Pasteur and His New Institute,” *Knoxville Journal* (TN), 10 March 1890, 13.

47. “Pasteur Building Dedicated,” *NYT*, 11 October 1893, 9; “An Hour with Paul Gibier,” *NYT*, 23 December 1893, 2.

48. “The Gossip of Gotham: Paul Gibier, the American Pasteur and His New Institute,” *Knoxville Journal* (TN), 10 March 1890, 13.

49. George Gibier Rambaud, “Paul Gibier,” *Bulletin of the Pasteur Institute* (September 1900): 9–14, on 11.

50. Paul Gibier, “Pasteur,” *New York Therapeutic Review* 4 (January 1896): 1–4, on 1 (in the footnote).

51. Pasteur Valléry-Radot, ed., *Correspondance de Pasteur 1840–1895*, vol. 3 (Paris: Flammarion, 1951) provides many examples of the appreciative correspondence from Pasteur to Bouley in the late 1870s and early 1880s, as well as the strategic nature of the relationship. Gibier is not mentioned by name in any of these letters, but in early August 1884, just days after Gibier’s thesis defense, Pasteur did ask Bouley about the status of his work on rabies. Louis Pasteur to Henri-Marie Bouley, 4 August 1884, in *Correspondance de Pasteur*, vol. 3, 436. On the Pasteur-Bouley relationship, see also Roland Rosset, “Pasteur et les Veterinaires,” *Le Bulletin de la Société Française d’Histoire de la Médecine et des Sciences Vétérinaires* 2 (2003): 1–25, esp. 4, 8–10. The *Dictionnaire de Biographie Française*, the only major reference source where Gibier appears, names him as a friend of Pasteur and also the prominent French chemist Michel Eugène Chevreul. “Gibier, Paul,” *Dictionnaire de Biographie Française*, vol. 15, 1458.

52. Patrice Debré, *Louis Pasteur*, trans. Elborg Forster (Baltimore: Johns Hopkins University Press, 1998; originally published by Flammarion, 1994), 483–91, quotation on 490.

53. Gibier, *Étude sur le Choléra d'après un Rapport Présenté à M. le Ministre de l'Intérieur sur l'Épidémie de 1884 de l'Arrondissement de Brignoles (Var.)* (Paris: Asselin et Houzeau, 1884); Gibier, *Recherches Expérimentales sur la Rage et sur son Traitement*; Gibier, *Etiología y tratamiento de la Fiebre Amarilla* (La Habana, 1888). In 1883, Gibier also apparently published a treatise or pamphlet titled *Les Découvertes Récentes sur les Êtres Microscopiques et Leur Application à l'Agriculture*, but I have been unable to locate an extant copy.

The importance of tacit knowledge to the process and the ease with which Gibier introduced rabies vaccination to New York City implies direct Pasteurian experience, which would support Rambaud's claim that Gibier spent several months at Pasteur's laboratory in 1886. It is not impossible, however, that he taught himself the technique, given his deep familiarity with bacteriological methods and the successes of at least some self-trained, self-declared "Pasteurians" around the world. For examples of autodidacts in bacteriology, see Löwy, "Yellow Fever in Rio de Janeiro," 146.

54. Moulin, "Patriarchal Science," 313.

55. Jean-Pierre Dedet, *Les Instituts Pasteur d'Outre-Mer*, 10. On other Pasteur Institutes that operated without sanction from Paris, see Moulin, "Patriarchal Science," 316, and Nadav Davidovitch and Rakefet Zalashik, "Pasteur in Palestine: The Politics of the Laboratory," *Science in Context* 23 (2010): 401–25, esp. 404, 421.

56. "He Leaped before a Mad Dog," *NYTr*, 4 July 1891, 7. By 1899, the cost had risen to \$200, including room and board for fifteen days. "April Meeting of the Massachusetts Association of Boards of Health—Anti-Rabic Institutions," *Journal of the Massachusetts Association of Boards of Health* 9 (July 1899): 46–47, on 46.

57. "Badly Bitten by a Bloodhound," *NYTr*, 15 June 1890, 13; "Moving Day for Inoculated Animals," *NYTr*, 9 June 1893, 11. In its report on the move to the new building, the *New York Tribune* also noted that "M. Pasteur has been kept well informed of the progress of the work in the United States, and is gratified with the establishment of a permanent home in which hydrophobia patients in America will be treated." Although it is a matter of speculation on my part, the unnamed donor for the new building, which had its inauguration ceremony in October 1893, could have actually been Gibier himself. Upon the opening, the *New York Times* indicated that most of the support for Gibier's rabies work came from the income of his private medical practice, made prosperous by a loyal Franco-American clientele. "Pasteur Building Dedicated," *NYT*, 11 October 1893, 9. On the NYPI's financing, see also "Dr. Gibier's New Institute," *NYH*, 19 June 1892, 30.

58. "Newark's Mad Dog Fright," *NYH*, 3 March 1891, 5; "To Treat New Jersey Patients Free," *NYTr*, 4 March 1891, 3.

59. "Laws of New York," *BDE*, 18 July 1895, 10. The state senator who promoted the bill apparently had a brother who was treated at the NYPI. "Pasteur Institute's Removal," *NYT*, 7 June 1898, 12.

60. For example, after the original funds left over from the treatment of the Newark boys dried up, municipal authorities in Hoboken launched another subscription drive in order to vaccinate a large group of children recently bitten by a mad dog in May

1896. See “The Children Will be Treated,” *NYTr*, 17 May 1896, 2, and “Jersey Cities and Towns: Hoboken,” *NYTr*, 22 May 1896, 15. Five years later, Jersey City’s mayor decided that two children in need of rabies vaccination should be covered at public expense, “as the children were injured in the public streets.” “Jersey City to Pay the Bill,” *NYT*, 24 September 1901, 7. In 1908, when a poor woman from Toronto required Pasteur treatment, Toronto’s mayor saw to her travel to New York City for vaccination. “Mutilated by Pet Dog,” *NYTr*, 23 August 1908, 5.

61. “This Bill Should Be Killed,” *NYH*, 29 March 1895, 8.

62. “For a Lymph Hospital: A Bacteriological Institute Here,” *NYTr*, 21 December 1890, 4. Despite the name change, observers and contemporaries, including Gibier, continued to refer to the organization as the New York Pasteur Institute. Historians of medicine and the bacteriological revolution have sometimes overestimated the divide between French and German approaches. When Gibier incorporated, he clearly planned to capitalize on all that both bacteriological schools could offer, and to provide clinical services based on the latest scientific advances, whatever their source. On the synergies between Pasteur’s and Koch’s approaches to bacteriology and immunization, see Ulrike Klöppel, “Enacting Cultural Boundaries in French and German Diphtheria Serum Research,” *Science in Context* 21 (2008): 161–80.

63. Advertisement for the “Central Park Sanatorium” in *New York Therapeutic Review* 2 (January 1894), on the back of the cover page and page i. Locomotor Ataxia was a complication from syphilis. On the history of the NYPI and Brown-Séquard’s therapies, see Merriley Borell, “Brown-Séquard’s Organotherapy and Its Appearance in America at the End of the Nineteenth Century,” *Bulletin of the History of Medicine* 50 (Fall 1976): 309–20. Although therapeutically dubious from a present-day perspective, and also to many turn-of-the-century physicians, glandular therapies were also common in their day, and historians recognize their significance for the development of endocrinology as a field of inquiry.

64. Course advertisement in the *New York Therapeutic Review* 2 (December 1894): 76.

65. For example, in Russia in 1886, the Kharkov Medical Society sent physicians to Paris to learn Pasteur’s rabies vaccination techniques and then established a Pasteur Institute in Kharkov the following year. In 1895, the Kharkov Pasteur Institute began to produce diphtheria antitoxin, and it manufactured a wide range of other vaccines and serums by the 1900s. S. S. Diachenko, “K 100-letiyu so dnya organizatsii Pasterovskogo Privivnogo Instituta i Bakteriologicheskoy Stantsii v g. Kharkova” (“The Hundredth Anniversary of the Founding of the Pasteur Vaccinal Institute and Bacteriological Station in the City of Kharkov”), *Vrachebnoe delo* (1989): 118–20. Similarly, in Palestine, Karl Böhm’s Pasteur Institute for Health, Medicine, and Biology carried out an array of bacteriological and educational activities related to public health. Davidovitch and Zalashik, “Pasteur in Palestine,” 411–12.

66. Here Bert Hansen has erred by seeing the NYPI as a forerunner of laboratory-based research institutions such as the Rockefeller Institute for Medical Research. Hansen, *Picturing Medical Progress*, 106. Rather, the NYPI’s production of biologicals was typical of American pharmaceutical companies in the 1890s.

67. “Elixir of Life,” *NYH*, 2 August 1889, 5 (for the quotations); Bonnie Ellen Blustein, *Preserve Your Love for Science: Life of William A. Hammond, American Neurologist* (Cambridge: Cambridge University Press, 1991), chs. 12–13.

68. Liebenau, *Medical Science and Medical Industry*, ch. 3.
69. Michael Willrich, *Pox: An American History* (New York: Penguin Books, 2011), 179–83; quotations on 179, 180.
70. Liebenau, *Medical Science and Medical Industry*, 60–66.
71. See the advertisements in *New York Therapeutic Review* 1 (January 1893), on the reverse side of the cover page and on p. viii.
72. Advertisement for the “Biological & Analytical Laboratory,” *New York Therapeutic Review* 4 (January 1896): iii; Liebenau, *Medical Science and Medical Industry*, 42–43.
73. Hansen, *Picturing Medical Progress*, 107–8; “Three More Sanitariums,” *NYTr*, 27 December 1895, 12; “To Remove the Pasteur Institute,” *NYTr*, 18 February 1898, 16; “Pasteur Institute’s Removal,” *NYT*, 7 June 1898, 12; “Pasteur Institute’s New Home,” *NYTr*, 7 June 1898, 5. Before the move to Suffern, Gibier benefited from the donation of a brood mare and sixty stalls at the Morton Stables at the intersection of Morton and Washington Streets, out of the owner’s gratitude for his 6-year-old son’s vaccination against rabies two years earlier. “Gratitude Shown in a Practical Way,” *NYTr*, 3 January 1895, 7.
74. Hansen, *Picturing Medical Progress*, 106–7; [Paul Gibier], “The Treatment of Diphtheria with the Anti-Toxine [sic] Made at the New York Pasteur Institute, with Reports of Cases,” *New York Therapeutic Review* 3 (March 1895): 1–10; [Paul Gibier], “Further Notes upon the Treatment of Diphtheria with the Antitoxin Made at the New York Pasteur Institute, with Reports of Cases,” *New York Therapeutic Review* 3 (June 1895): 29–38; “A Local Report on Antitoxin,” *New York Therapeutic Review* 4 (December 1896): 93.
75. “Report of the American Pediatric Society’s Collective Investigation into the Use of Antitoxin in the Treatment of Diphtheria in Private Practice,” reported at the Eighth Annual Meeting held at Montreal, Canada, 26 May 1896, in *Journal of the American Medical Association* 27 (4 July 1896): 27–35, on 32, quotation on 32n2.
76. John F. Anderson, “Federal Control of Vaccine Virus,” *Journal of the American Medical Association* 44 (10 June 1905): 1838.
77. Willrich, *Pox*, ch. 5.
78. For a copy of Gibier’s will, see Folder, “Pasteur—US Institute: New York—Paul Gibier,” Pasteur Foundation (US), New York, NY. The Pasteur Foundation in New York City is a fund-raising arm of the Pasteur Institute in Paris and shares no direct institutional lineage with Gibier’s New York Pasteur Institute.
79. Willrich, *Pox*, 207–8; Liebenau, *Medical Science and Medical Industry*, 34, 79.
80. See, for example, Tomes, *The Gospel of Germs*; Latour, *The Pasteurization of France*; Barbara Gutmann Rosenkrantz, *Public Health and the State: Changing Views in Massachusetts, 1842–1936* (Cambridge, MA: Harvard University Press, 1972); and John Duffy, *A History of Public Health in New York City, 1866–1966* (New York: Russell Sage Foundation, 1974). On European visitors to the Research Laboratory, including Robert Koch in 1908, as well as other evidence of American public health’s international stature, see Oliver, *The Man Who Lived for Tomorrow*, 111–12, 145, 272, 307–8.
81. C.-E. A. Winslow, *The Life of Hermann M. Biggs, Physician and Statesman of the Public Health* (Philadelphia: Lee and Febiger, 1929), 61–70; “Dr. Biggs to Visit Pasteur,” *NYT*, 10 December 1885, 3.
82. Oliver, *The Man Who Lived for Tomorrow*, 95, 141, 150; Anna Wessels Williams,

unpublished autobiography, chapter 11, p. 1, Box 1, Folder “1894–1896 XI Birth of Ideas,” Anna Wessels Williams papers. For additional biographical information on Williams, consult the website of the National Library of Medicine: http://www.nlm.nih.gov/changingthefaceofmedicine/physicians/biography_331.html (accessed January 4, 2019). On Mary Putnam Jacobi’s life and career, see Carla Bittel, *Mary Putnam Jacobi and the Politics of Medicine in Nineteenth-Century America* (Chapel Hill: University of North Carolina Press, 2009). For a full historical account of the history of diphtheria control in New York City in the late nineteenth and early twentieth century, consult Evelyn Maxine Hammonds, *Childhood’s Deadly Scourge: The Campaign to Control Diphtheria in New York City, 1880–1930* (Baltimore: Johns Hopkins University Press, 1999).

83. *Annual Report of the Board of Health of the Department of Health of the City of New York for the Year Ending December 31, 1905*, vol. II (New York: Martin B. Brown Company, 1906); *Annual Report of the Board of Health of the Department of Health of the City of New York for the Year Ending December 31, 1906*, vol. II (New York: Martin B. Brown Company, 1907); “Laboratory Completed,” *NYT*, 24 August 1905, 12.

84. Hermann M. Biggs to William H. Park, 19 July 1896, full text of the letter reproduced in Oliver, *The Man Who Lived for Tomorrow*, 149–50. Unfortunately, neither Park’s nor Biggs’s personal papers have survived, so Oliver remains the only source for this letter, as well as other correspondence to and from Park.

85. Liebenau, *Medical Science and Medical Industry*, 100.

86. Oliver, *The Man Who Lived for Tomorrow*, 173; “To Treat Hydrophobia Cases,” *NYT*, 10 March 1898, 12; *Annual Report of the Department of Health of the City of New York for the Calendar Year 1913* (New York, 1914), 102. For examples of fees charged by the Department of Health for preventive hydrophobia treatment, see the entries for 29 January, 19 February, 27 May, 3 June, and 8 July in “Minutes, Board of Health, 1908FF, 1–8–08 to 7–8–08,” Municipal Archives, New York, NY, and entries for 30 September, 7 October, 23 October, 13 November, 2 December, and 23 December in “Minutes of the Board of Health 1908 GG, 7–16–08 to 12–30–08,” Municipal Archives, New York, NY. “Again That Wave of Revolt against City Dogs,” *NYTr*, 31 May 1908, B2 reported that Pasteur institutes generally charged \$100–150 for a full course of preventive hydrophobia treatment, whereas the NYCDH charged just \$25 for vaccine by mail.

87. *Annual Report of the Board of Health of the Department of Health of the City of New York for the Year Ending December 31, 1907* (New York: Martin B. Brown Company, 1908), 50–52; *Annual Report of the Board of Health of the Department of Health of the City of New York for the Year Ending December 31, 1909* (New York: Martin B. Brown Company, 1911), 62.

88. See *Annual Report of the Board of Health of the Department of Health of the City of New York for the Year Ending December 31, 1907*, 51, for statistics on dogs examined in 1907, and *Report of the Board of Health of the Department of Health of the City of New York for the Years 1910 and 1911* (New York, 1912), 63, for statistics on dogs examined for the years from 1908 to 1911. For data on subsequent years, see the board’s annual reports for the years from 1912 to 1917.

89. “Has Rabic Antitoxin,” *NYTr*, 14 July 1907, 1. The NYPI reported no patient deaths, while the Department of Health reported a single death and a mortality rate of 0.3 percent.

90. “Bills Passed at Albany,” *NYT*, 2 April 1901, 5; “Laws of New York: By Authority,” *BDE* 20 July 1901, 7.

91. “Two Claimants for Dog’s Body,” *NYTr*, 28 August 1907, 3.

92. “Fights Dog on Stairway,” *NYTr*, 21 August 1911, 1; “Chokes Dog to Death after a Long Battle,” *NYTr*, 26 March 1912, 1.

93. “Millionaire in Race against Hydrophobia,” *Baltimore American*, 4 May 1907, 1; “Millionaire in Death Race,” *Columbus Enquirer-Sun* (GA), 7 May 1907, 7; “Mad Dog Bites Millionaire,” *Cleveland Plain Dealer*, 4 May 1907, 1. See also “Treat Procter Here,” *NYTr*, 4 May 1907, 1; “Soap Magnate Fears Rabies,” *Kansas City Star*, 3 May 1907, 3; “Procter Bitten by Mad Dog,” *Times-Picayune* (New Orleans), 4 May 1907, 4; and “Treatment for Dog Bite,” *Morning Oregonian* (Portland), 4 May 1907, 1. Other papers told a counterstory, in which Procter was in town for business and laughed off reports of his rabies-inspired flight from Cincinnati. “Mr. Procter Hasn’t Rabies,” *NYT*, 4 May 1907, 9; “Says Dog Is Innocent,” *Fort Worth Telegram*, 5 May 1907, 15. The *Tribune*, however, claimed that Procter was attempting to protect his privacy and undertake Pasteur treatment in secret. “Treat Procter Here,” *NYTr*, 4 May 1907, 1.

94. “Storm over Procter: Pasteur Men Indignant,” *NYTr*, 5 May 1907, 1.

95. “Storm over Procter: Pasteur Men Indignant,” *NYTr*, 5 May 1907, 1; Liebenau, *Medical Science and Medical Industry*, 100–01.

96. “Storm over Procter: Pasteur Men Indignant,” *NYTr*, 5 May 1907, 1. The health department pronounced Procter out of danger three days later. “Mr. Procter Out of Danger,” *NYTr*, 8 May 1907, 6. Although he was in New York City no more than a week (the *Tribune* reported in its May 4 story that he had arrived in secret three days earlier), by 1907, the Department of Health could have easily sent him home with the remaining series of inoculations.

97. “City Fighting Rabies,” *NYTr*, 23 May 1908, 3.

98. Thomas Darlington to George B. McClellan Jr., 24 February 1908, Office of the Mayor, McClellan, George B., Administration, Department Correspondence 1904–1909, Roll 49 (Box: 43 Fol. 432 Health, Depart. of to Box: 43 Fol. 439 Law Dept.), Municipal Archives, New York, NY.

99. *Annual Report of the Board of Health of the Department of Health of the City of New York for the Year Ending December 31, 1902* (New York: Martin B. Brown Company, 1904), 375–76; “Treatment of Rabies by the Health Department,” *MR* 68 (22 July 1905); 145; *Annual Report of the Board of Health of the Department of Health of the City of New York for the Year Ending December 31, 1907* (Martin B. Brown Company, 1908), 320.

100. “Public Health School,” *NYTr*, 20 February 1909, 2.

101. “Rabies,” *MR* 76 (9 October 1909): 616–17, on 617, notes that the US Public Health and Marine-Hospital Service started to distribute kits for preventive hydrophobia treatment in April 1906.

102. In the spring of 1899, a committee of the Massachusetts Association of Boards of Health looked into the availability of rabies vaccination in the United States and found just three providers: the NYPI, Antonio Lagorio’s Pasteur Institute in Chicago, and a Pasteur Institute at Baltimore’s City Hospital. Although the New York Department of Health had authorized departmental provision of rabies vaccination, apparently the program was not yet operational, and Hermann Biggs passed the Massachusetts inquiry along to the NYPI. “Anti-Rabic Institutions,” *Journal of the Massachusetts*

Association of Boards of Health 9 (July 1899): 46–47. By 1912, at least forty-two institutions around the country administered Pasteur treatments, and five different companies and laboratories manufactured the injections for physicians in private practices. “Rabies in the United States,” *MR* 82 (24 August 1912): 344.

103. “New Serum to Prevent Rabies,” *NYTr*, 20 June 1908, 4; “First Use of New Rabies Serum,” *NYTr*, 24 June 1908, 5. The Paris Pasteur Institute was licensed under the Biologics Control Act, which allowed its products entry into the American market.

104. For much of the period from 1905 to 1907, Wheeler seemed to conduct most of the daily work of the NYPI and to act as the institute’s main public face. “Race for Boy’s Life,” *NYTr*, 14 July 1907, 1, identified Wheeler as “acting director of [the] Pasteur Institute.”

105. “Dr. Rambaud in Bad Shape,” *NYTr*, 5 August 1911, 7; “Dr. Rambaud May Recover,” *NYTr*, 7 August 1911, 5.

106. “Friedmann Makes Test of His Serum,” *NYT*, 7 March 1913, 1 (for the quotations); “Dr. Rambaud Joins Turtle Germ Group,” *NYTr*, 27 May 1913, 1; “Health Board Bars Use of Turtle Germ,” *NYTr*, 30 May 1913, 1; “Dr. Rambaud Explains,” *NYTr*, 1 June 1913, 4; “Friedmann Work before the Censors,” *NYT*, 3 June 1913, 4.

107. “Woman Doctor for War,” *NYTr*, 14 October 1914, 7; “New War Relief Body Organized. . . Dr. G. G. Rambaud Going to the Front,” *NYTr*, 5 November 1914, 3.

108. “Pasteur Institute Ends,” *NYT*, 21 September 1918, 7; Hansen, *Picturing Medical Progress*, 294n26.

109. Williams, unpublished autobiography, chapter 15, 1–2, quotation on 2, Box 2, Folder “7 Autobiography Chapters XIII–,” Anna Wessels Williams papers.

Chapter 6 • Dogs and the Making of the American State

1. “Dr. Goldwater Aims to End Dog Dangers,” *NYT*, 24 July 1914, 7.

2. “Muzzles the Dogs All the Year ’Round,” *NYT*, 29 July 1914, 6.

3. For example, some three decades ago, in a discussion in which they agreed on little else, Terrence J. McDonald and Ira Katznelson called upon scholars to integrate the history of urban politics, including “the definition and redefinition of *public* and *private*,” into analyses of American political development. Terrence J. McDonald, “The Burdens of Urban History: The Theory of the State in Recent American Social History,” *Studies in American Political Development* 3 (1989): 3–29; Ira Katznelson, “‘The Burdens of Urban History’: Comment,” *Studies in American Political Development* 3 (1989): 30–51. The quotation is from McDonald, “The Burdens of Urban History,” 26.

4. William Novak, “The Myth of the ‘Weak’ American State,” *American Historical Review* 113 (June 2008): 752–72, on 765.

5. Novak, “The Myth of the ‘Weak’ American State,” 762; Max Weber, *Economy and Society: An Outline of Interpretive Sociology*, ed. Guenther Roth and Claus Wittich, trans. Ephraim Fischhoff et al., vol. 2 (Berkeley: University of California Press, 1978), 956–1001.

6. Historians have been quicker to recognize the fluidity of the public-private boundary prior to the Civil War. See Hendrik Hartog, *Public Property and Private Power: The Corporation of the City of New York in American Law, 1730–1870* (Ithaca, NY: Cornell University Press, 1983), and William J. Novak, *The People’s Welfare: Law and Regulation in Nineteenth-Century America* (Chapel Hill: University of North Carolina Press, 1996).

On the period since 1870, the literature has largely neglected voluntary organizations' statist functions. Histories concerning the policing of sexual activity and its cultural representation, for example, often refer to voluntary organizations but have generally devoted little sustained analysis to citizens' groups' exercise of state power. See, for example, Allan M. Brandt, *No Magic Bullet: A Social History of Venereal Disease in the United States since 1880*, expanded ed. (New York: Oxford University Press, 1987), and George Chauncey, *Gay New York: Gender, Urban Culture, and the Making of a Gay Male World, 1890–1940* (New York: Basic Books, 1994), ch. 5. In *Prurient Interests*, Andrea Friedman acknowledges the status of the New York Society for the Suppression of Vice “as a private organization granted law-enforcement responsibilities,” but her overall emphasis on “democratic moral authority” reinforces an analytical separation between civil society and the state. Friedman, *Prurient Interests: Gender, Democracy, and Obscenity in New York City, 1909–1945* (New York: Columbia University Press, 2000), quotation on 133.

Daniel P. Carpenter provided an important intervention by exploring the public-private collaborations involved in the enforcement of the Comstock Laws. Carpenter, *The Forging of Bureaucratic Autonomy* (Princeton, NJ: Princeton University Press, 2001), chs. 3–5. More recently, Susan J. Pearson has addressed with great insight the private exercise of state power in child and animal protection organizations' application of the police power. Susan J. Pearson, *The Rights of the Defenseless: Protecting Animals and Children in Gilded Age America* (Chicago: University of Chicago Press, 2011). Other important reconsiderations include Theda Skocpol, Marshall Ganz, and Ziad Munson, “A Nation of Organizers: The Institutional Origins of Civic Voluntarism in the United States,” *American Political Science Review* 94 (September 2000): 527–46; William J. Novak, “The American Law of Association: The Legal-Political Construction of Civil Society,” *Studies in American Political Development* 15 (Fall 2001): 163–88; Christopher Capozzola, *Uncle Sam Wants YOU: World War I and the Making of the Modern American Citizen* (New York: Oxford University Press, 2008); Brian Balogh, *A Government Out of Sight: The Mystery of National Authority in Nineteenth-Century America* (Cambridge: Cambridge University Press, 2009); and Carol Nackenoff and Julie Novkov, eds., *Statebuilding from the Margins: Between Reconstruction and the New Deal* (Philadelphia: University of Pennsylvania Press, 2014).

7. William J. Novak, “Public-Private Governance: A Historical Introduction,” in *Government by Contract: Outsourcing and American Democracy*, ed. Jody Freeman and Martha Minow (Cambridge, MA: Harvard University Press, 2009), 23–40, esp. 25–26.

8. “Dogs Rampant—To the Rescue,” *NYT*, 11 July 1856, 8; emphasis original.

9. Christopher Capozzola, “‘The Only Badge Needed is Your Patriotic Fervor’: Vigilance, Coercion, and the Law in World War I America,” *Journal of American History* 88 (March 2002): 1354–82.

10. Hartog, *Public Property and Private Power*, 63.

11. “Mad Dogs,” *NYH*, 17 May 1836, 2.

12. Hartog, *Public Property and Private Power*, 132; John Duffy, *A History of Public Health in New York City, 1866–1966* (New York: Russell Sage Foundation, 1974), xx; Amy Bridges, *A City in the Republic: Antebellum New York and the Origins of Machine Politics* (Cambridge: Cambridge University Press, 1983), 3; James F. Richardson, *The New York Police: Colonial Times to 1901* (New York: Oxford University Press, 1970), chs. 2 and 3;

Amy S. Greenberg, *Cause for Alarm: The Volunteer Fire Department in the Nineteenth-Century City* (Princeton, NJ: Princeton University Press, 1998).

13. Carpenter, *The Forging of Bureaucratic Autonomy*, 84–88.

14. New York City's dog ordinances remained seasonal throughout the nineteenth century, even though the American Medical Association's 1856 study had already demonstrated that rabies could appear at any time of the year, and in subsequent decades experts and editorialists frequently protested that summer dog ordinances made little sense when statistics showed rates of rabies were as high or higher at other times of the year. Thomas W. Blatchford, *Hydrophobia: Its Origin and Development, as Influenced by Climate, Seasons, and Other Circumstances* (report of the special committee on hydrophobia, American Medical Association) (Philadelphia: T. K. and P. G. Collins, 1856); "Minor Topics," *NYT*, 20 June 1867, 4; "The Board of Health," *NYH*, 24 June 1869, 4; "Dogs in Trouble," *NYT*, 13 June 1874, 8; "The Harlem Flats," *NYH*, 30 June 1875, 8; "Dr. Russel on Hydrophobia," *NYT*, 2 March 1881, 8; *First Annual Report of the Board of Health of the Health Department of the City of New York, April 11, 1870, to April 10, 1871* (New York: New York Printing Company, 1871), 238.

15. Examples of court cases abound, but the following sampling provides a good sense of the legal principles involved: "The Courts," *NYTr*, 19 October 1876, 2; "A Dog's Bite," *BDE*, 17 February 1882, 4; "Mr. Tuttle's Terror," *BDE*, 8 July 1885, 4; [untitled], *NYT*, 22 February 1886, 4; "Symptoms of Hydrophobia," *BDE*, 12 May 1897, 2; "Spot's Nip May Cost \$5000," *NYTr*, 9 October 1915, 5.

16. "The Great Dog War of 1848," *NYH*, 16 July 1848, 2; "City Dogs," *NYT*, 26 June 1857, 8.

17. On the creation of a new middle-class identity centered on the family, see Mary P. Ryan, *Cradle of the Middle Class: The Family in Oneida County, New York, 1790–1865* (Cambridge: Cambridge University Press, 1981). On anxieties surrounding urban anonymity, consult Karen Halttunen, *Confidence Men and Painted Women: A Study of Middle-Class Culture in America, 1830–1870* (New Haven, CT: Yale University Press, 1982). The evolution of working-class identities is addressed at length in Christine Stansell, *City of Women: Sex and Class in New York, 1789–1860* (Urbana: University of Illinois Press, 1987; originally published 1986), and Richard B. Stott, *Workers in the Metropolis: Class, Ethnicity, and Youth in Antebellum New York City* (Ithaca, NY: Cornell University Press, 1990). Elite identities remained in flux, but a cohesive, self-identified urban bourgeoisie emerged by the early 1890s. Sven Beckert, *The Monied Metropolis: New York City and the Consolidation of the American Bourgeoisie, 1850–1896* (Cambridge: Cambridge University Press, 1993).

18. *Sentell v. New Orleans and Carrollton Railroad Company* 166 US 698, 701 (1896).

19. Pearson, *The Rights of the Defenseless*, 29–33; Katherine C. Grier, *Pets in America: A History* (Chapel Hill: University of North Carolina Press, 2006), 127–31; Jennifer Mason, *Civilized Creatures: Urban Animals, Sentimental Culture, and American Literature, 1850–1900* (Baltimore: Johns Hopkins University Press, 2005), 13–18.

20. Diane L. Beers, *For the Prevention of Cruelty: The History and Legacy of Animal Rights Activism in the United States* (Athens: Swallow Press / Ohio University Press, 2006), ch. 3, esp. 51. On refinement, consult Richard L. Bushman, *The Refinement of America: Persons, Houses, Cities* (New York: Alfred A. Knopf, 1992).

21. On children and the street trades, see Stansell, *City of Women*, 204–6, and

Timothy J. Gilfoyle, *A Pickpocket's Tale: The Underworld of Nineteenth-Century New York* (New York: W. W. Norton, 2006), ch. 2. For estimates of wages in 1850s New York, consult Stott, *Workers in the Metropolis*, 106, 165; Edwin G. Burrows and Mike Wallace, *Gotham: A History of New York City to 1898* (Oxford: Oxford University Press, 1999), 665; and Edward K. Spann, *The New Metropolis: New York City, 1840–1857* (New York: Columbia University Press, 1981), 147.

22. Letter to the Editor from “B.,” “Dog Laws,” *NYH*, 10 August 1848, 1.
23. “That Dog Pound—Onslaught of the Canines,” *NYT*, 26 June 1855, 8.
24. See, for example, “About Dogs,” *NYT*, 30 May 1854, 4; “Can the Mayor Legalize Dog Stealing?” *NYH*, 27 June 1859, 6; and “The Dog Nuisance,” *BDE*, 22 June 1870, 4.
25. “A Citizen,” “The City’s Dog Catchers: They Steal Dogs Walking Quietly with Their Owners,” *NYT*, 12 June 1892, 11.
26. “Concerning Dogs,” *NYT*, 27 September 1868, 4.
27. Henry Bergh to Mr. Marriott, Pound-master, 16 June 1874, published in “Local Miscellany: The Dogs,” *NYT*, 17 June 1874, 8.
28. “General City News: About the Dog-Pound in the Dog-Days,” *NYT*, 26 July 1860, 8.
29. “Dog Record for the Week,” *NYTr*, 31 August 1857, 7.
30. “A Tragedy of the Dog Pound,” *NYTr*, 22 September 1856, 7.
31. “Local Intelligence: The Pound of Dog-Flesh,” *NYT*, 3 August 1867, 8.
32. “An Importunate Candidate,” *NYT*, 18 August 1874, 4; “The Dog Ordinance in New York,” *BDE*, 18 August 1874, 4. See also “A Rising Politician,” *NYH*, 19 August 1874, 6.
33. “A Complaint against a Dog Catcher,” *NYH*, 24 July 1874, 9; “Dogs’ Doomsday,” *NYH*, 24 June 1879, 5; “Justice for Dogs and Their Owners,” *NYH*, 4 July 1877, 4; “Death to Dogs,” *NYH*, 19 June 1878, 8; [untitled], *NYT*, 24 July 1883, 4 (for the quotations); “Dog Catchers at Work,” *NYH*, 29 June 1886, 2.
34. Edward P. Buffet, “Bergh’s War on Vested Cruelty,” typescript, 7 vols., [1929?], American Society for the Prevention of Cruelty to Animals, New York, NY. The ASPCA also consistently defended the value of pet ownership regardless of class. For example, it opposed efforts to limit dogs to single-family households. “To Fight Decree of Banishment for Dogs,” *NYT*, 8 November 1902, 7. The early literature in animal studies placed a strong emphasis on social control, but recent works have favored more nuanced interpretive approaches. See, for example, Pearson, *The Rights of the Defenseless*, esp. 5–8, 173–74, and Mason, *Civilized Creatures*, 119–56, 173, esp. 121–24.
35. [Untitled], *BDE*, 2 July 1877, 2.
36. On increased reform activity in the 1890s, see Martin V. Melosi, *Garbage in the Cities: Refuse, Reform, and the Environment*, rev. ed. (Pittsburgh, PA: University of Pittsburgh Press, 2005), chs. 2 and 4.
37. Bernard Oreste Unti, “The Quality of Mercy: Organized Animal Protection in the United States, 1866–1930 (PhD diss., American University, 2002), 76, 79, 81; Joseph D. Fay, *Digest of the Laws of the State of New York: Comprising the Revised Statutes and Statutes of General Interest in Force on January 1, 1874*, vol. 1 (New York: James Cockcroft and Company, 1874), 290, 292, 355 (quotation on 355).
38. Fay, *Digest of the Laws of the State of New York*, 356; Pearson, *The Rights of the Defenseless*, 3 (for the quotation).

39. "Our Mad Dogs," *NYH*, 22 June 1873, 14.
40. "Poor Dog Tray," *NYH*, 13 June 1874, 3; "Bergh and the Dogs," *NYH*, 17 June 1874, 9; "Presentment by the Grand Jury on the Dog Question," *NYH*, 20 June 1874, 5; "The Dogs," *NYH*, 20 June 1874, 5; "Dog Destruction," *NYH*, 21 June 1874, 12; "Arrest of the Dog Suffocater [*sic*]," *NYT*, 21 June 1874, 7; "The Dog Pound," *NYT*, 25 June 1874, 8; "A Disgusting Butchery," *NYT*, 28 June 1874, 7. "At the Pound," *NYH*, 2 July 1874, 5.
41. "The Dogs," *NYH*, 24 July 1874, 9; "The Law and the Dog Catchers," *NYH*, 23 June 1877, 11; "The Canine Race," *NYH*, 29 March 1878, 5; "Dogs in Quod," *NYH*, 28 June 1879, 2.
42. "To Catch Dogs Politely," *NYT*, 11 March 1894, 3; Unti, "The Quality of Mercy," 473–78. Uniforms as a marker of occupation and function proliferated in the nineteenth century. On the adoption of uniforms for New York City's newly created police force in the 1840s, see Richardson, *The New York Police*, 64–66. The ASPCA fielded its corps of uniformed dogcatchers at about the same time that the New York City Department of Street Cleaning insisted on an all-white uniform for the city's street cleaners. Melosi, *Garbage in the Cities*, 53–55. In both cases, uniforms buttressed an image of the organized, efficient, and self-disciplined character of city services.
43. As the historical literature has documented, the depiction of urban politics as morality play was complicated by the periodic ability of urban reformers to win concessions from machine governments more easily than from reform mayoral administrations. Not infrequently, the ASPCA found a more receptive audience in Tammany Hall than from New York's reform mayors. See Buffet, "Bergh's War on Vested Cruelty," vol. 5, Folder "Progress toward an A.S.P.C.A. Shelter and Hospital."
44. See Novak, *The People's Welfare*.
45. Carpenter, *The Forging of Bureaucratic Autonomy*, 83–88 and 102–12.
46. Henry Bergh, Letter to the Editor, "Mr. Bergh on the Dog Question," *NYT*, 2 July 1874, 5; Unti, "The Quality of Mercy," 475; Pearson, *The Rights of the Defenseless*, 152–63, 173–74.
47. "Henry Bergh Dead," *NYH*, 13 March 1888, 5.
48. "Work of the Dog-Catcher," *NYTr*, 2 August 1896, 24.
49. "Annual Meeting of the American Society for the Prevention of Cruelty to Animals: Address of President Haines," *OAF* 27 (February 1900), 122.
50. See, for example, "Brooklyn Dogs and Dog Catchers," *NYT*, 20 August 1894, 9.
51. Novak, *The People's Welfare*, ch. 6; Hartog, *Public Property and Private Power*, 71–76, 131–32, 201n71, 208. It would be tempting to reinterpret Charles Rosenberg's classic account of the improvised responses of New York City's government to cholera epidemics in 1832 and 1849 in the context of the regulatory traditions identified by Novak. Rosenberg, *The Cholera Years* (Chicago: University of Chicago Press, 1962), chs. 1, 5, and 6.
52. Rosenberg, *The Cholera Years*, ch. 11, esp. 210–11; Judith Walzer Leavitt, *The Healthiest City: Milwaukee and the Politics of Health Reform* (Princeton, NJ: Princeton University Press, 1982), 45.
53. Duffy, *History of Public Health in New York City*, chs. 2–4; Leavitt, *The Healthiest City*, 49–50, 79–92; Melosi, *Garbage in the Cities*, ch. 1; Barbara Gutmann Rosenkrantz, *Public Health and the State: Changing Views in Massachusetts, 1842–1936* (Cambridge, MA: Harvard University Press, 1972), ch. 2.

54. Duffy, *History of Public Health in New York City*, chs. 5 and 11; Rosenkrantz, *Public Health and the State*, ch. 4; Evelyn Maxine Hammonds, *Childhood's Deadly Scourge: The Campaign to Control Diphtheria in New York City, 1880–1930* (Baltimore: Johns Hopkins University Press, 1999). Other scholars have placed greater emphasis on the continuities between the sanitary science of the mid-nineteenth century and germ theory, but they also have sensed an important shift in the microbe's role in providing a new focus for disease prevention. See Nancy Tomes, *The Gospel of Germs: Men, Women, and the Microbe in American Life* (Cambridge, MA: Harvard University Press, 1998), and, on the reception of germ theory in France, Bruno Latour, *The Pasteurization of France*, trans. Alan Sheridan and John Law (Cambridge, MA: Harvard University Press, 1998).

55. "Rabies (Not) on Staten Island," *OAF* 26 (May 1899), 194.

56. "Convinced by Death," *NYTr*, 17 March 1903, 14; "Rabid Dog Finally Killed," *NYT*, 20 March 1903, 7.

57. "Dr. Gill for Muzzling," *NYTr*, 2 April 1903, 14.

58. "Men Rabid, Not Dogs," *NYTr*, 3 April 1903, 3.

59. "Department of Agriculture May Control Dogs," *NYTr*, 12 April 1903, 2.

60. "Doctors Favor Muzzle," *NYTr*, 18 April 1903, 6; "Rabies Prevalent in New York," *MR* 63 (18 April 1903): 623; "Topics of the Times," *NYT*, 22 April 1903, 8.

61. "Another Midsummer Madness: The Muzzle," *OAF* 29 (July 1902): 243–44.

62. Letter to the Editor from John P. Haines, "Rabies and Hydrophobia," *NYT*, 6 April 1903, 8. See also "Rabies and 'Hydrophobia,'" *OAF* 30 (May 1903): 193–95.

63. "Hydrophobia—Correspondence between Mr. Bergh and Mayor Hoffman," *NYT*, 16 June 1868, 2; "Hydrophobia," *NYH*, 24 May 1869, 8; Letter to the Editor from Henry Bergh, "The Dogs and Their Sufferings," *NYT*, 5 July 1872, 4; "The Board of Health on Dogs," *NYH*, 10 June 1874, 3.

64. Charles P. Russel, "Hydrophobia in Dogs and Other Animals," in *Fifth and Sixth Annual Reports of the Board of Health of the Health Department of the City of New York. May 1, 1874 to December 31, 1875* (New York: Martin B. Brown Company, 1876), 716–63.

65. Russel, "Hydrophobia in Dogs and Other Animals," 759.

66. In 1895, for example, some physicians in Elizabeth, New Jersey, objected to muzzling as a potential source of rabies, rather than a preventive measure. "Elizabeth," *NYTr*, 10 August 1895, 12.

67. "Dog Ordinance Amended," *NYT*, 10 June 1903, 16; "Notice to the Owner of Dogs," *OAF* 31 (August 1904): 575 (for the quotation). *Our Animal Friends* republished its "Notice" in every subsequent issue until the journal ceased publication in 1906.

68. Eugene W. Scheffer, Secretary, Department of Health, to George B. McClellan, Mayor, City of New York, 28 January 1908 (two letters), Office of the Mayor, McClellan, George B., Administration, Department Correspondence 1904–1909, Microfilm Roll 49, Municipal Archives, New York, NY. The source of the department's mortality data for 1907 is unclear, since its own annual report for 1907 documented only fourteen hydrophobia deaths. Combined with eight deaths from the disease the previous year, however, 1907 nonetheless marked a significant spike in deaths from rabies. *Annual Report of the Board of Health of the Department of Health of the City of New York for the Year Ending December 31, 1907* (New York: Martin B. Brown Company, 1908), 789.

69. "No Rabies in This City," *NYT*, 7 April 1908, 6.

70. "Again that Wave of Revolt against City Dogs," *NYTr*, 31 May 1908, B2.
71. Minutes of the Board of Health, 17 June 1908, in Minutes, Board of Health, 1908FF, 1–8–08 to 7–8–08, Municipal Archives, New York, NY; "Another Rabies Victim," *NYTr*, 11 June 1908 3; "Dr. Darlington and the Dogs," *NYTr*, 26 June 1908, 6; "Unmuzzled Dogs Now Shot on Sight," *NYT*, 30 July 1908, 1.
72. "Unmuzzled Dogs Now Shot on Sight," *NYT*, 30 July 1908, 1 (for the quotation); "Dog Slaughter Stirs S.P.C.A. to Protest," *NYT*, 31 July 1908, 12; Minutes of the Board of Health, 5 August 1908, in Minutes of the Board of Health 1908GG, 7–16–08 to 12–30–08, Municipal Archives, New York, NY.
73. "Making a Shambles of the Streets," *NYT*, 31 July 1908, 4. See also "Their Mistakes of Judgment, Not of Purpose," *NYT*, 5 August 1908, 4.
74. Walter A. Dyer, Letter to the Editor, *NYT*, 1 August 1908, 6.
75. "Charges Brutality in Dog Killing," *NYT*, 7 August 1908, 12.
76. "Prosecutes One Policeman," *NYT*, 12 August 1908, 2.
77. "Dog Shot at Theatre Door," *NYT*, 11 August 1908, 5.
78. "Threat to Dr. Bensel," *NYTr*, 6 August 1908, 1; "Dr. Bensel Threatened Again," *NYTr*, 11 August 1908, 4; "Dr. Darlington Laughs at Threat to Kill Him," *New York Evening World*, 17 August 1908, 6; "Beware! Dr. Darlington!," *NYS*, 18 August 1908, 1; "Dr. Bensel Threatened Again," *NYTr*, 25 August 1908, 8. For the quotation about the rumored rescission of the shoot-to-kill policy, see "Health Board May End the Dog Killing," *NYT*, 12 August 1908, 2. For the quotation from Darlington, see "Slaughter of the Dogs Is to Be Kept Up," *NYT*, 13 August 1908, 2. In response to critics, Darlington also claimed publicly that praise for the board's actions far outpaced hate mail. "Letter of an Amiable Lady," *NYS*, 7 August 1908, 5.
79. "S.P.C.A. July Death Record 27,597," *NYTr*, 9 August 1908, 5; "S.P.C.A.'s July Killings," *NYS*, 9 August 1908, 2. Four years later, the ASPCA pointed out that it destroyed some 300,000 small animals per year, mainly cats and just 60,000 dogs. "Extreme Rigor Needed in Fighting the Ever Increasing Hydrophobia Malady," *NYTr*, 9 June 1912, A4. If that same ratio held in 1908, then the ASPCA killed about 5,500 dogs in July 1908.
80. "Health Board Ready to Smile at Decree," *NYT*, 14 August 1908, 4.
81. "Dr. Darlington's Bughound," *Washington Post*, 6 September 1908, SM7.
82. *Annual Report of the Board of Health of the Department of Health of the City of New York for the Year Ending December 31, 1908*, vol. 1 (New York: Martin B. Brown Company, 1909), 369.
83. "No 'Dogless City' for New Yorkers," *NYT*, 23 August 1914, 15.
84. Department of Health, "Press Bulletin No. 305," Office of the Mayor, Mitchel, John P., Administration, Departmental Correspondence Received 1914–1917, Microfilm Roll 40, Municipal Archives, New York, NY.
85. S. S. Goldwater, Commissioner, Department of Health, to Mrs. A. J. Wells, 4 September 1914, Office of the Mayor, Mitchel, John P., Administration, Departmental Correspondence Received 1914–1917, Microfilm Roll 40.
86. S. S. Goldwater to B. deN. Cruger, 4 September 1914, Office of the Mayor, Mitchel, John P., Administration, Departmental Correspondence Received 1914–1917, Microfilm Roll 40.
87. On bureaucrats' creation of constituencies in order to support their autonomy,

see Carpenter, *The Forging of Bureaucratic Autonomy*. See also Duffy, *History of Public Health in New York City*, ch. 11, on Goldwater's successful tenure.

88. See, for example, Secretary to the Commissioner to Dr. Hyatt Lyke, 19 September 1914; Secretary to the Commissioner to Baroness Gertrude de Graffenreid, 21 October 1914; Secretary to the Commissioner to Mr. Elmer De Pue, 19 October 1914; and Secretary to the Commissioner to Miss Nina E. Mills, n.d. [November 1914], all in Office of the Mayor, Mitchel, John P., Administration, Departmental Correspondence Received 1914–1917, Microfilm Roll 40.

89. Department of Health, "Press Bulletin No. 305," Office of the Mayor, Mitchel, John P., Administration, Departmental Correspondence Received 1914–1917, Microfilm Roll 40.

90. "Dr. Goldwater to Remain," *NYT*, 29 September 1914, 9.

91. "Sanitary Code Amendments," *NYT*, 30 July 1914, 8.

92. "Praise Muzzling Rule," *NYT*, 3 December 1914, 14.

93. Letter to the Editor from James G. Rossman, "Says Dog Lovers Would Support Modified Law," *NYTr*, 15 November 1914, A6; Letter to the Editor from James Gardner Rossman, "D.L.P.A. to Look into Alleged Rabies Cases," *NYTr*, 29 November 1914, A6.

94. *Annual Report of the Department of Health of the City of New York for the Calendar Year 1915* (New York, 1916), 50. See also "Many Lives Saved by Dog Muzzles," *NYTr*, 3 October 1915, 12; "Cases of Rabies Decrease," *NYT*, 3 October 1915, 28; and "Show Decrease in Rabies," *NYT*, 22 January 1916, 6.

95. *Annual Report of the Department of Health of the City of New York for the Calendar Year, 1916* (New York, 1917), 22, 27, 58–59. See also "Hear of Quaker War Work," *NYT*, 28 January 1917, E3.

96. *Annual Report of the Department of Health of the City of New York for the Calendar Year 1917* (New York, 1918), 28.

97. *Annual Report of the Department of Health of the City of New York for the Calendar Year 1918* (New York, 1919), 61.

98. *Lochner v. New York* 198 US 45 (1905). On the limited reach of *Lochner*, see Christopher Tomlins, "The Supreme Sovereignty of the State: A Genealogy of Police in American Constitutional Law, from the Founding Era to *Lochner*," in *Police and the Liberal State*, ed. Markus D. Dubber and Mariana Valverde (Stanford, CA: Stanford Law Books, 2008), 49–51.

99. *Fox v. the Mohawk and Hudson River Humane Society* 165 New York 517, quotations on 526.

100. "The Shelter Law Amended," *OAF* 29 (May 1902): 193; "Legal and Constitutional Status of the A.S.P.C.A.," *OAF* 30 (January 1903): 98–102; ASPCA, *Thirty-Ninth Annual Report for the Year Ending December 31, 1904* (New York, 1905), 143–58. The quotation is from "Legal and Constitutional Status of the A.S.P.C.A.," 100.

101. "Attacks S.P.C.A. Methods," *NYT*, 28 February 1906, 5. In its annual report for 1913, the Department of Health also complained that New York City's canine animal control policy granted "to a private corporation . . . functions which properly belong to the health authorities." *Annual Report of the Department of Health of the City of New York for the Calendar Year 1913* (New York, 1914), 103.

102. "The Tale of a Dog as Told by Coler," *NYT*, 1 February 1908, 3; "Dogs in the News," *NYTr*, 9 February 1908, A4 (for the quotations from Coler and McClellan);

“Dog License Knocked Out,” *NYT*, 16 October 1908, 12; “Hasn’t Got His Dog Despite Injunction,” *NYT*, 17 October 1908, 16; *Coler v. ASPCA* 122 New York Supplement 549–52 (1908).

103. *Coler v. ASPCA* 122 New York Supplement 549–52 (1908). Note that under the New York judicial system, the state supreme courts are, in fact, trial courts.

104. See Novak, *The People’s Welfare*.

105. *Coler v. ASPCA* 122 New York Supplement 552 (1908).

106. *Coler v. ASPCA* 122 New York Supplement 552 (1908). On the broader legal and political trend that stressed individual rights over state action and formally constituted political authority over the fluid public-private relationship of the nineteenth century, consult Novak, *The People’s Welfare*, 237, 241–45, and Novak, “Police Power and the Hidden Transformation of the American State,” 69. For a classic critique of the *Lochner* era and formalistic readings of law, see Roscoe Pound, “Liberty of Contract,” *Yale Law Journal* 18 (May 1909): 454–87. A standard reading in the recent literature of *Lochner* and legal formalism appears in Sandra Ruffin, “Legal Process,” in *Encyclopedia of the Supreme Court of the United States*, ed. David S. Tanenhaus, 5 vols. (New York: Macmillan Reference USA, 2008), III, 161–62. One should acknowledge, however, that legal scholars have hotly debated the historical status of legal formalism and the extent to which it existed independently of its Progressive critics. For competing points of view, see, for example, Morton J. Horwitz, *The Transformation of American Law 1870–1960: The Crisis of Legal Orthodoxy* (Oxford: Oxford University Press, 1992), 9–32; Anthony J. Sebok, *Legal Positivism in American Jurisprudence* (Cambridge: Cambridge University Press, 1998); and Neil Duxbury, *Patterns of American Jurisprudence* (Oxford: Clarendon Press, 1995), 9–64.

107. Minutes of the Board of Health, 22 January 1908, in Minutes, Board of Health, 1908FF.

108. “Dogs in the News,” *NYTr*, 9 February 1908, A4.

109. “Hasn’t Got His Dog Despite Injunction,” *NYT*, 17 October 1908, 16.

110. “No Warrants for S.P.C.A.,” *NYT*, 13 November 1910, C4.

111. *The People ex rel. Henry E. Westbay, Plaintiff, v. Michael Delaney, a Police Officer of the City of New York, Defendant* 1911 NY Misc. LEXIS 462.

112. “Dog Bill in Effect Today,” *NYT*, 1 July 1917, 13; “New York Dogs Still Safe,” *NYT*, 2 July 1917, 7.

113. *Nicchia v. People of the State of New York* 254 US 228 (1920), 228–31. On property law and dogs, see *Sentell v. New Orleans and Carrollton Railroad Company* 166 US 698 (1896).

114. For examples of political attacks on the ASPCA in the 1930s and 1940s, see “Janitor’s Dog Back in Form of an Issue,” *NYT*, 6 February 1930, 15; “City Again Dooms Unleashed Dogs,” *NYT*, 11 August 1944, 16; Sydney H. Coleman, Executive Vice President, ASPCA, in Letter to the Editor, “A.S.P.C.A. States Its Case,” *NYT*, 1 March 1945, 20; and “Stebbins Defends Dog License Bill,” *NYT*, 4 March 1945, 35.

115. Letter to the Editor from Ronny Menschel, Executive Administrator, Office of the Mayor, “The Only Way to Fund the ASPCA,” *NYT*, 16 August 1980, 20; “New York’s Dog Deal,” *NYT*, 27 November 1981, A26; Dorothy J. Gaiter, “Deal on Deficit Reached by City and ASPCA,” *NYT*, 2 June 1982, B3; “A Better Deal for Dogs and Cats,” *NYT*, 11 November 1985, A18; “A \$22.8 Million ASPCA Expansion,” *NYT*, 24 September 1989, R1.

116. Marion S. Lane and Stephen L. Zawistowski, *Heritage of Care: The American Society for the Prevention of Cruelty to Animals* (Westport, CT: Praeger Publishers, 2008), 41–47; Jonathan P. Hicks, “ASPCA Plans to Stop Killing Strays,” *NYT*, 26 March 1993, B1; Francis X. Clines, “A Society Spurns Death for Animals,” *NYT*, 8 January 1995, 25.

117. Michael Brandow, *New York’s Poop Scoop Law: Dogs, the Dirt, and Due Process* (West Lafayette, IN: Purdue University Press, 2008), 299–300; Scott Stringer, Manhattan Borough President, “Led Astray: Reforming New York City’s Animal Care and Control,” available at http://www.shelterreform.org/uploads/4/2/2/8/4228982/final_led_astray.pdf (accessed January 6, 2019). I also derived my understanding of New York City’s dog licensing requirements and administration from the website of the city’s Department of Health and Mental Hygiene, at a link that is no longer active: <http://www.nyc.gov/html/doh/html/licenses/vet-doglicense.shtml> (accessed March 2013).

118. Elizabeth Hess, “Shelter Skelter,” *New York Magazine*, 10 October 1998, http://nymag.com/nymetro/urban/pets_animals/features/2773/ (accessed January 28, 2019).

119. Scott Stringer, “Led Astray,” 8–12.

120. Arguably, the central issue for the CACC has more to do with persistent underfunding than inherent flaws in administrative structure.

121. On quasi-governmental bodies and public authority, see Gail Radford, “From Municipal Socialism to Public Authorities: Institutional Factors in the Shaping of American Public Enterprise,” *Journal of American History* 90 (December 2003): 863–90. Judith Walzer Leavitt used the term “semi-municipal” to describe the public health work of Milwaukee’s Child Welfare Commission in the early twentieth century; her choice of terminology indicates the lack of a basic vocabulary for describing voluntary organizations’ governmental functions in 1980s historiography. Leavitt, *The Healthiest City*, 223.

122. Lassiter made his observation at a roundtable titled “Governing Out of Sight: An Enduring Pattern of American Political Development,” Policy History Conference, Columbus, OH, 3–6 June 2010.

123. Capozzola, *Uncle Sam Wants YOU*, 12.

124. Elisabeth S. Clemens, “Lineages of the Rube Goldberg State: Building and Blurring Public Programs, 1900–1940,” in *Rethinking Political Institutions: The Art of the State*, ed. Ian Shapiro, Stephen Skowronek, and Daniel Galvin (New York: New York University Press, 2006), 380–443. I thank Carol Nackenoff for alerting me to Clemens’s delightful descriptor.

Conclusion

1. Nor has my examination of rabies’ history been exhaustive. I had originally hoped to say more about veterinary medicine and also the agricultural dimensions of rabies in upstate New York, but I leave these and other topics to future scholarship.

2. Monica Murphy and Bill Wasik, “Undead: The Rabies Virus Remains a Medical Mystery,” *Wired Magazine*, 26 July 2012, https://www.wired.com/2012/07/ff_rabies/ (accessed January 4, 2019).

3. The idea of an “ecology of knowledge” comes from a classic essay by Charles E. Rosenberg: “Toward an Ecology of Knowledge: On Discipline, Context, and History,” in

Rosenberg, *No Other Gods: On Science and American Social Thought*, rev. and expanded ed. (Baltimore: Johns Hopkins University Press, 1997; original edition published 1976), 225–39.

4. At the time when I originally wrote this sentence, I was interrupted by the desires of a certain ginger tabby, who demanded that I chase her down and provide an attentive belly rub.

5. Herbert Asbury, *The Gangs of New York: An Informal History of the Underworld* (New York: Vintage Books, 2008; originally published 1928), 45–46, 53–56; Edward P. Buffet, “Bergh’s War on Vested Cruelty,” typescript, 7 vols., [1929?], vol. 5, folders “Sportsmanship of the Pit and the Epic of Kit Burns,” “Harry Jennings after Kit’s Death—His New Orleans Experience,” “Exploits of Other Sportsmen,” and “Cock Fighting,” American Society for the Prevention of Cruelty to Animals, New York, NY; Elliott J. Gorn, *The Manly Art: Bare-Knuckle Prize Fighting in America*, updated ed. (Ithaca, NY: Cornell University Press, 2010; originally published 1986); Richard B. Stott, *Workers in the Metropolis: Class, Ethnicity, and Youth in Antebellum New York City* (Ithaca, NY: Cornell University Press, 1990), 230–43; “After Michael Vick, the Battle to Stop Dogfighting,” interview with John Goodwin and Sean Moore by Dave Davies, “Fresh Air,” National Public Radio, 24 September 2009, available at <http://www.npr.org/templates/story/story.php?storyId=113158123>; “Humane Society CEO on Michael Vick, New Profile,” interview with Wayne Pacelle by Scott Simon, “Weekend Edition Saturday,” National Public Radio, 9 April 2011, <http://www.npr.org/2011/04/09/135212472/humane-society-ceo-on-katrina-michael-vick-and-more>.

6. Michael Brandow, *New York’s Poop Scoop Law: Dogs, the Dirt, and Due Process* (West Lafayette, IN: Purdue University Press, 2008); Katherine C. Grier, *Pets in America: A History* (Orlando, FL: Harcourt, 2006; originally published with different pagination by University of North Carolina Press, 2006), 98, 100–103.

7. “Hydrophobia,” *NYH*, 9 August 1884, 4.

8. “Three Dogs Taking Pasteur Treatment,” *NYT*, 15 June 1908, 16; Susan D. Jones, *Valuing Animals: Veterinarians and Their Patients in Modern America* (Baltimore: Johns Hopkins University Press, 2003), 130–34. Japanese researchers developed a regular vaccination protocol for dogs in 1918 and mandated canine vaccinations as a public health measure four years later. American veterinary experts first introduced the Japanese vaccine in 1922, and Los Angeles County attempted a compulsory vaccination order in 1923, but these early efforts did not become standard practice. The safer Flury LEP vaccine, developed in the United States in the 1940s, helped to facilitate regular vaccination of pets. Karen Brown, *Mad Dogs and Meerkats: A History of Resurgent Rabies in Southern Africa* (Athens: Ohio University Press, 2011), 125–26; John Douglas Blaisdell, “A Frightful, but Not Necessarily Fatal, Madness: Rabies in Eighteenth-Century England and English North America” (PhD diss., Iowa State University, 1995), 205.

9. City of New York, “Rabies—Frequently Asked Questions,” <https://www1.nyc.gov/site/doh/health/health-topics/rabies-faq.page> (accessed January 4, 2019); US Centers for Disease Control and Prevention, “Human Rabies Surveillance,” http://www.cdc.gov/rabies/location/usa/surveillance/human_rabies.html (accessed January 4, 2019). The CDC recorded an exceptionally bad year in 2011, when six people in the United States died from rabies.

10. New York State Department of Health, “The Raccoon Rabies Epidemic,” <https://>

www.wadsworth.org/programs/id/rabies/history (accessed January 4, 2019); City of New York, “Animals Testing Positive for Rabies in New York City in 2010,” <https://www1.nyc.gov/site/doh/health/health-topics/rabies-stats-2010.page> (accessed January 4, 2019); Bill Wasik and Monica Murphy, *Rabid: A Cultural History of the World’s Most Diabolical Virus* (New York: Penguin Books, 2012), 226–27.

11. Lisa W. Foderaro, “Coyotes Create Dangers and Divisions in New York Suburbs,” *NYT*, 23 June 2015, online edition; Benjamin Mueller and Lisa W. Foderaro, “A Coyote Eludes the Police on the Upper West Side,” *NYT*, 22 April 2015, online edition; Michael Schwirtz, “Police Capture a Coyote in Manhattan’s Battery Park City,” *NYT*, 25 April 2015, online edition.

12. World Health Organization, “Rabies: Fact Sheet,” 13 September 2018, <http://www.who.int/mediacentre/factsheets/fs099/en/>; World Health Organization, “Rabies: Epidemiology and Burden of Disease,” n.d., <http://www.who.int/rabies/epidemiology/en/> (accessed January 4, 2019); Anna S. Fahrion et al., “Human Rabies Transmitted by Dogs: Current Status of Global Data, 2015,” *WHO Weekly Epidemiological Record* 91 (15 January 2016): 13–20, on 13; “India’s Ongoing War against Rabies,” *Bulletin of the World Health Organization* 87 (December 2009): 885–964, available online at <http://www.who.int/bulletin/volumes/87/12/09-021209/en/>; WHO Representative Office, China, “Rabies,” <http://www.wpro.who.int/china/mediacentre/factsheets/rabies/en/> (accessed January 4, 2019). On the dog vaccination campaign that followed a major rabies outbreak in Bali in 2008, see Wasik and Murphy, *Rabid*, ch. 8, esp. 208–21. Note: the WHO updates its rabies fact sheet periodically, and some of the content may have changed since I originally consulted this source. The same may be true of the undated WHO sites.

13. See Brown, *Mad Dogs and Meerkats*.

14. “Almost 5,000 Dogs Killed in Chinese Anti-rabies Campaign,” *Guardian*, 7 September 2014, online edition; Wang Zhuoqiong, “Heihe Kills Plans to Exterminate the City’s Canines,” *China Daily*, 27 May 2009, 4; Shan Juan, “Thousands of Dogs Culled in Plan to Take Bite out of Rabies,” *China Daily*, 3 June 2009, 4.

15. Rama Lakshmi, “India Has 30 Million Stray Dogs,” *Washington Post*, 21 October 2016, online edition.

Appendix 2 • A Note on Primary Sources and Methods

1. Jon M. Harkness, “The Reception of Pasteur’s Rabies Vaccine in America: An Episode in the Application of the Germ Theory of Disease” (master’s thesis, University of Wisconsin, 1987); Jon M. Harkness, “Rabies and Research: A History of the New York Pasteur Institute,” unpublished manuscript, 15 April 1989, copies in possession of the author.

2. Charles E. Rosenberg, *The Cholera Years* (Chicago: University of Chicago Press, 1962) remains the foremost exemplar of the older approach, as well as a critically important piece of scholarship even after more than half a century.

3. More precisely, my research rests on the *Tribune* from 1841 to 1920, the *Times* from 1851 to 1920, the *Eagle* from 1841 to 1902, and the *Herald* from 1835 to 1898. The post-1902 part of the Brooklyn Public Library’s database became available too late for my work, and the digitized version of the *Herald* contains some significant gaps during the period covered.

4. When I inquired about a university subscription for ProQuest's *New York Tribune* database, our acquisitions librarian told me it would cost CAD\$14,000 per annum, which even I had to concede was a lot to pay for a collection that would likely have few other users at my university.

5. For a superb work of medical history that engages late nineteenth-century Brooklyn on its own terms with enormous clarity and perspicacity, see Regina Morantz-Sanchez, *Conduct Unbecoming a Woman: Medicine on Trial in Turn-of-the-Century Brooklyn* (Oxford: Oxford University Press, 1999).

6. Irene Maxine Pepperberg's careful studies of cognition in grey parrots, along with other work in ethology that has moved away from behaviorism, has increasingly established sentence as an axiomatic assumption for thinking about the cognitive abilities of birds and mammals. Pepperberg, *The Alex Studies: Cognitive and Communicative Abilities of Grey Parrots* (Cambridge, MA: Harvard University Press, 1999).

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